THE IRON AGE

A Review of the Hardware, Iron, Machinery and Metal Trades.

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New York, Thursday, October 18, 1906.

A Heavy New Haven Lathe.

The 36-in. engine lathe shown in Fig. 1 is the first of a line of heavy tools which is being brought out by the New Haven Mfg. Company, New Haven, Conn. The continuous heavy duty incident to the use of high speed steel tools has been borne in mind in designing this new line of machines and material and workmanship consistent with the production of powerful tools have been employed. A change gear box of the sliding gear type has been provided, which furnishes a wide range of feeds and screw pitches, and the use of a positive clutch between the driving shaft and the lead screw makes it especially easy to cut threads of special pitch.

The mechanism of the gear box is shown in detail in Figs. 2 and 4. The driving gear is on the outer end of the lead screw extension. The lead screw is reduced on its end and has an end bearing on a bronze bushing at the end of the extension A, Fig. 2. The shaft B is mounted on eccentric bushings similar to the back shaft and there is no danger of conflict. Handles C and G are interlocking, so that it is impossible to engage the sliding gear F with more than one of the gears K at the same time.

The apron, Figs. 5 and 6, is of the double wall box form, bevel gear driven and powerfully geared throughout. When either the cross or longitudinal feeds are in the lead screw nut is automatically locked in open position and vice versa, so that a conflict is impossible. A friction binder controls either feed, and the hand wheel pinion may be disengaged while cutting threads. All feeds are obtained through the gear box and are equal in number to four times the number of threads given on the index plate for a given position of the lever. A rigid and compact taper attachment is fastened to the rear of the carriage and controls the compound rest without interfering with the use of the cross feed screw for adjusting the tool. It will turn tapers up to 4 in. per ft. and 24 in. long, and is graduated both in inches per foot, and degrees. The carriage bridge is of unusual strength, 13¾ in. in width and of trussed form. Slots, front and

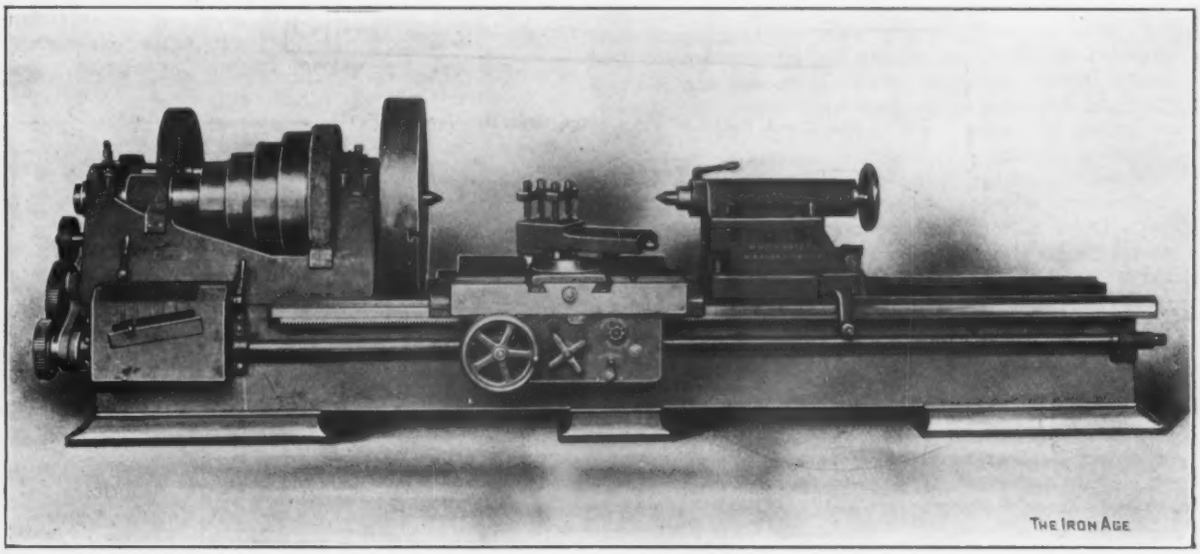


Fig. 1.—The New 36-In. Heavy Lathe Built by the New Haven Mfg. Company, New Haven, Conn.

of the headstock, and is operated and locked in position by the handle C. Turning on B is the quill D, driven from A by the bevel gears E E. On the quill is the sliding gear F, controlled by the handle G, Fig. 3, which projects through the front of the box. The sliding gear engages one of the nest of gears K, keyed to the lead screw. The sliding clutch L, Fig. 2, on the end of the lead screw, operated by the lever M, Fig. 3, engages a clutch on the gear E, Fig. 2. All of the gears are steel, when desired.

To follow the operation of the gear box in cutting a thread, presuming that the number of threads to be cut is six, with a 48-tooth gear on A, the handle G is brought under the column containing 6 on the index plate fastened to the front of the box and the handle C is pressed down. The drive is then through E E F and gear K. To cut two threads to the inch the drive is direct from A to the lead screw through the clutch, the gears of the change gear box not being used. When special threads are wanted two gears can be used on the spindle and screw, and through the medium of the clutch the drive is the same as if there were no gear box on the lathe. In addition to the usual range of threads spirals of one turn in 1 in. to one turn in 12 in. may be cut by throwing in the back gears and shifting the feed gears. The handle C is locked in vertical position automatically back, are provided for clamping work to the carriage, and there is also a carriage binder for facing work. The compound rest has power feed in all directions and is graduated in degrees. The cross feed screws are also graduated.

The tailstock has a pawl engaging a rack cast solid in the bed, which makes slipping under heavy duty impossible. The forged crucible steel spindle has a 3-in. hole through it and has a front bearing 6⅞ in. in diameter and 11 in. long. Both front and back bearings are circular in form and of special bronze. The thrust is taken on bronze and tool steel rings, hardened and ground. The adjustment and thrust coming at the back end of the headstock eliminate the effect of expansion on the adjustment. With a single-speed countershaft 10 spindle speeds in geometrical progression are obtained, ranging from 3 to 350 rev. per min. The maximum belt power is 94 ft. of 4¾-in. double belt per revolution of spindle, the back gear ratio being 15 to 1.

The lathe illustrated has a 36-in. swing over the bed, and is made in any length from 14 up to 36 ft. The lathe is also built with triple-geared head, having a back gear ratio of 8 to 1, and triple gear ratio of 50 to 1, giving a maximum belt travel of 290 ft. of 6-in. belt per revolution of the spindle, which makes it one of the most powerful lathes on the market.

Scotch Shipbuilders and Steel Makers.

GLASGOW, October 3, 1906.—The Scotch steel makers who are associated with the North of England steel makers for the regulation of prices, so that one section may not undersell the other in its own area, are encountering a strong feeling of resentment among the shipbuilders. The combination has not only put an end to plate competition in Scotland and the North of England (even though ship plates have not been put up to an inordinately high price), but under the agreement English plate makers can sell in Belfast some 12 to 15 shillings per ton lower than Scotch plate makers can sell to the Clyde shipbuilders. The Belfast shipbuilders are thus given a large advantage over the Clyde shipbuilders. The latter claim that the Scotch steel makers really depend on them and have been largely created by the Scotch shipbuilding industry, but are now favoring their competitors. The matter has got to such a pass that the Clyde shipbuilders are quietly negotiating among themselves to start a steel plant of their own for the manufacture of all the steel shipbuilding material they require.

When a combination was formed some years ago among the bolt, rivet and nut manufacturers of the West of Scotland the shipbuilders in self-protection got up a bolt, rivet and nut company of their own. This has not only prevented them from being held up by the combination, but has proved a financial success. The argument is that a shipbuilders' plate, bar and angle plant would be equally successful. If one should be built the steel makers have only themselves to blame for it, and some of them are getting badly off for orders now that the shipbuilding boom is dying. There are still a good many shipbuilding contracts to work off, but the material has already been contracted for and in part made, and there is no new work coming in, though for other purposes than shipbuilding steel is in demand. B. T.

A flywheel 19 ft. in diameter, weighing 60 tons, was recently built by the Nordberg Engineering Company, Milwaukee, Wis., for the Calumet & Hecla Mining Company. At 107 rev. per min., its intended speed, it will have a peripheral velocity of nearly 6400 ft. per min. There are 12 spokes, cast hollow, having a 5-in. open hearth steel bolt set radially into each with countersunk round nuts at either end. Two steel rings are bolted against either side by 58 2-in. bolts, which further reinforce the rim. The two-piece cast iron center is held together by four T-head steel links shrunk into pockets in the rim in the usual manner, and also by two steel shrink rings on the hub and four shrink rings under the rim.

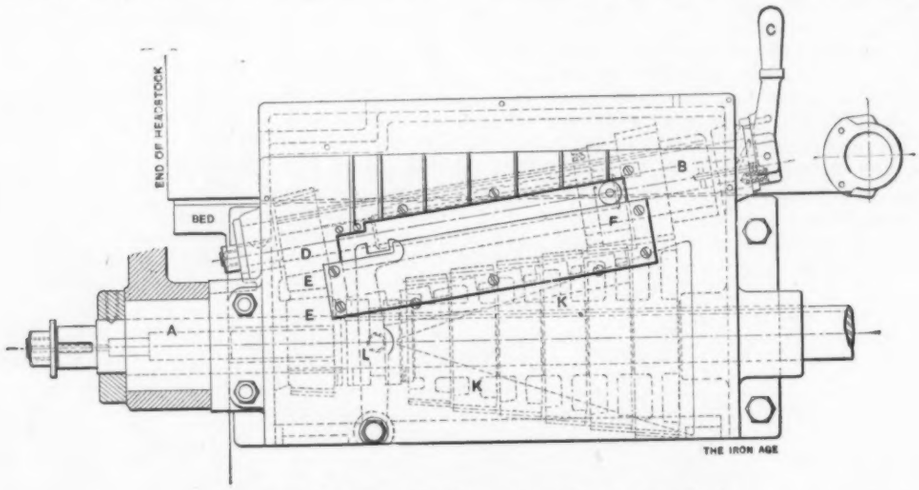


Fig. 2.—A Detail of the Change Gear Box for the Feeds.

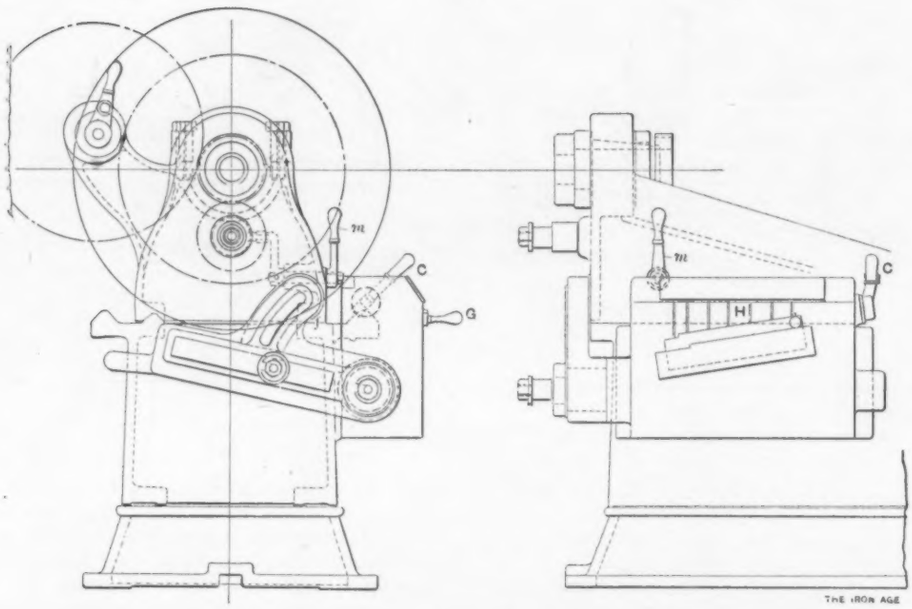


Fig. 3.—Detail End and Side Views Showing the Manipulation of the Change Gear Feed.

Comparing a turbo-alternator of 1500 kw. with a reciprocating engine driven alternator of same capacity very considerable differences are noted, especially in dimensions and weights. The turbo-alternator under consideration is operated at a speed of 1000 rev. per min. and delivers three-phase current at a pressure of 11,000 volts,

with a power factor of 85 per cent., and calls for 6000 alternations per minute (50 cycles per second). The diameter of the rotor is 48 in., giving a peripheral velocity of 12,500 ft. per minute (142 miles per hour). The weight of the stator is 25,000 lb.; of the rotor, 11,000 lb.;

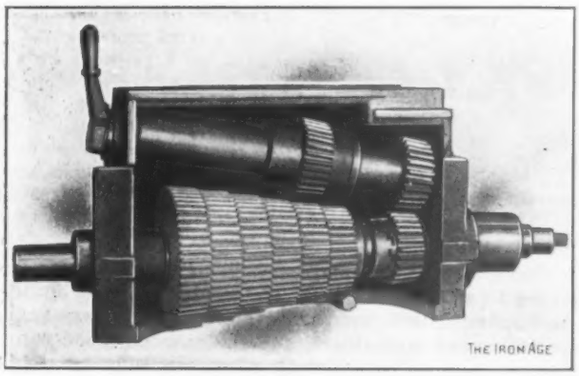


Fig. 4.—Rear View of the Gear Box.

total weight, 36,000 lb., or 24 lb. per kilowatt normal output. The reciprocating engine driven machine, operating at 94 rev. per min., has a stator which weighs complete 40,000 lb.; rotor, 30,000 lb.; total, 70,000 lb., or 47 lb. per kilowatt output. Not only this, but the turbo-machine requires no flywheel, the high rotative speed of

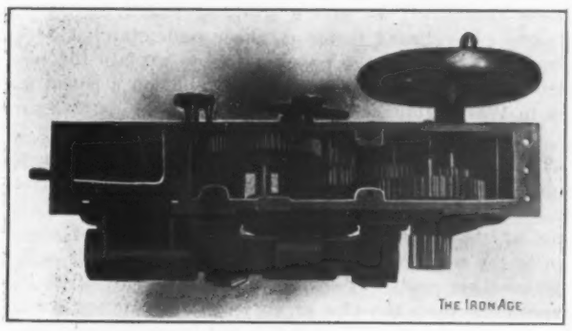


Fig. 5.—Top View of the Apron Removed.

the rotor containing enough energy-storage capacity in itself; whereas the other machine has a flywheel weighing 90,000 lb, bringing the total weight to 160,000 lb., or 107 per kilowatt. The flywheel effect of the rotor alone in the turbo outfit is 8750 foot-tons, or 5.8 per kilowatt; in

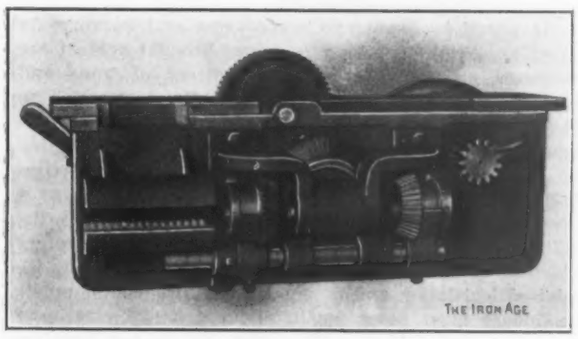


Fig. 6.—Rear View of the Apron Removed.

the other the effect of rotor and flywheel is 3700 foot-tons, or 2.5 per kilowatt. Of the total weight of the turbo-generator 16,000 lb. is active iron and 2500 active copper; with the slower moving generator the active iron is 16,000 lb., as with the other, but the active copper required is no less than 8500 lb.

The Railroads and Mining.*

Some of the Relations of Railroad Transportation in the United States to Mining and Metallurgy.

BY DR. JAMES DOUGLAS, NEW YORK.

The marvelous feats which two generations of engineers, in handling steam and electricity, have enabled us to perform, may not be duplicated by equal progress during the next half century; but it goes without saying that but for our transportation facilities we would not occupy in the world's race the same advanced position we have acquired to-day, for the very vastness of our country and the actual distance from one another and from population of our resources would have rendered many of them valueless. But given control of steam the great size of our mineral deposits and the long distance our continental areas require that we transport material have inspired our transportation engineers to work on a larger scale than their fellow craftsmen across the sea. We handle longer trains, with larger cars, and as a rule at a much lower rate of freight than they do. Otherwise neither our miner nor our metallurgist could perform the duty required of them.

Take for instance the cost of transporting a ton of iron ore from Lake Superior to Pittsburgh—70 cents from the mines to Duluth, a distance of 80 miles; 75 cents for 1000 miles by steamer to Cleveland (though the rate has been as low as 57 cents, and though, when the first shipments were made from Michigan in 1856, the rate was $3); then $1.18 from Lake Erie points to Pittsburgh, a distance of 135 miles—making the total transportation $2.63 for 1250 miles, including transfers. Or take the rate of $10, at which copper is transported from Montana to the Atlantic, a distance of nearly 3000 miles. Soft coal is carried by Eastern roads at about ½ cent per ton a mile, but the rate on some Western roads is as low as 40 mills a ton per mile. Nor is it only in the iron trade that low rates of carriage have helped us metallurgists.

Low Fuel Rates Necessary.

The necessity of low fuel rates to economical metallurgy is obvious, especially when treating ores such as those of copper, whose percentage of valuable metal is so low that, even after water concentration, as many as 20 tons of charge are probably smelted on an average to yield 1 ton of copper. In such cases the fuel must be carried to the ore—not the ore to the fuel, as when smelting rich iron ores. At the Copper Queen Works in the early days the cheapest coke was Cardiff patent pressed, brought round the Horn in wheat ships to San Francisco. It cost more than three times the price at which New Mexico or Colorado coke is now delivered, after a railroad haul of 800 to 1000 miles. Coal for steam generation was then so costly that the country was swept clear of its scanty accessible forests. For raising steam crude oil is now brought in from Texas and California at a freight rate not exceeding ¾ cent per ton mile; so that at one smelting works in southern Arizona, 700 miles from the nearest coal or available petroleum wells, power is generated at a cost for fuel, maintenance and all expenses of $79 per ton per year. Montana draws its coke largely from Pennsylvania, or from coke ovens on Lake Superior, fed with Pennsylvania coal, the fuel traveling over 2000 miles from the pits to the furnaces.

While complaint may be made against some railroads for charging exorbitant rates on coal our Western roads are certainly not culpable, or Montana would not be able to turn out in metallic copper about one-fifth of the world's total, and Arizona about one-seventh of the world's total, though both are situated in the heart of a continent and between 2000 and 3000 miles distant from the point where their crude product is refined and marketed.

* From an oration delivered before the graduating class under the Faculty of Applied Science, at Columbia University, New York, June 12, 1906.

Interdependence of Interests.

The interdependence of mines on railroads and of railroads on mines is best appreciated by some familiar examples of what each does. The town of Butte and the great Butte mines are situated on a mountain side, facing a valley beneath whose surface water can be reached in any quantity and at all seasons only by wells, but where none flows. The two great corporations operating there have been obliged, therefore, if they were to concentrate mechanically their large tonnage of low grade ore, to transport their ores to water. A site 26 miles distant was selected by the Anaconda Company, and thither to its new Washoe Works are carried daily from Butte, of its own and custom ore, about 9000 tons, at a cost of about $5 per car, or 14 cents per ton. As the ore contains less than 3 per cent. of copper per ton and $1.29 in gold and silver, a haul of that length would be profitable only if carried at such low rates of freight. The other large company, the Boston & Montana, sends its ores 170 miles to Great Falls, where, however, the company has the advantage of water power.

The mining, transportation and smelting operations of our large corporations are on a stupendous scale, but the transportation is as essential an item in the result as the mining and smelting. For the United States Steel Corporation there were handled last year 18,486,556 tons of Lake Superior ore, and the corporation itself manufactured 12,242,909 tons of coke, which must have used up 20,000,000 tons of coal. This coal production is exclusive of 2,204,950 tons mined by itself alone. For flux it used 4,000,000 tons of limestone. About 38,000,000 tons of freight, therefore, as ore, fuel and flux, must have been transported, half of it for over an average of 1000 miles, in addition to 10,000,000 tons of finished product for a shorter distance. A total of about 48,000,000 tons of freight were contributed by this single corporation. As it made only 9,940,799 tons, out of 22,992,380 tons of pig iron made in this country, or 43 per cent. of the whole, the total tonnage moved for a longer or shorter distance by the iron smelting industry must have been approximately 109,000,000 tons.

How Cheap Transportation Helps the Metallurgist.

An interesting instance of the facilities which transportation gives the metallurgist is afforded by the shipment of copper matte from Tennessee to the heart of Mexico, where it has been used to collect gold and silver from dry ores in the furnace and converter, and then returned for electrolytic refining and separation to the United States. Copper bars come from New Zealand to be refined here and the refined product is returned to Europe for consumption, for we ship abroad about 40 per cent. of our production. But for cheap carriage, often for long distances, of ore necessary to make a profitable mixture in lead and copper furnaces, many a district would be unexplored and unexploited. Till recently, for instance, the mines at Globe, Ariz., languished for want of sulphur and iron flux, and could barely make 1,000,000 lb. of copper a month. But the railroads, appreciating the needs of the miner and appreciating what is their own true interest, published a low ore tariff, which enabled pyrites to be imported from distant districts where it is in excess, and as a result the production rapidly rose to 3,000,000 lb. a month.

The copper industry, as compared with the iron trade, if gauged by the quantity of copper produced, is insignificant, but if measured by the ore raised in making a ton of copper, it assumes very different proportions. Instead of 2 tons of ore to the ton of metal, as in the case of iron, the average of ore mined, previous to water concentration, is more nearly 40 tons, and therefore there are handled to make our annual output of 460,000 tons of copper about 18,000,000 tons of ore. Though this is not carried the same distance that iron ore is carried to fuel nearly all of it is moved by steam for a longer or shorter distance, and as about 4 tons of fuel are consumed to make 1 ton of copper, nearly 20,000,000 tons of freight must be carried by the railroads to enable us to maintain our position in the copper world.

Low Grade Freight Assists Higher Class Freight.

Without going into the economies of railroad rates I would remind you that the low rates at which are carried these large quantities of low grade freight, on which the very existence of our large metallurgical industries depend, could be given only if supplemented by higher rates on higher class freight. And the very remunerative wages given miners and mill workers and the high standard of their living give the railroad a large proportion of such profitable traffic. For instance, on a railroad with which I am connected and which depends almost exclusively for its traffic on mines, the proportion of the different classes of freight is approximately as follows:

Ore	49 per cent.	83 per cent. of traffic is carried at a very low rate.
Coke	16 per cent.	
Coal and petroleum	3 per cent.	
Lumber	8 per cent.	
Copper bullion	7 per cent.	
Merchandise, fodder, &c.	17 per cent.	at a higher rate.

Our Western copper industry, like our iron industry, sprang into life on the touch of the railroad. Not until the Southern Pacific approached Arizona in 1880 was any notable copper made there, and the railroad alone galvanized Butte within a year afterward into activity. And to-day our increasing production of that much sought after metal is due either to railroad extension into new regions or to lower freight rates over existing railroads. For our railroads have been learning that their prosperity depends on the healthy growth of the industries along their lines, and that these industries can be starved to death by high freight rates or fed into lusty vigor by encouragement. I venture to think that none of us—miner or metallurgist—will often be driven to take advantage of any of the useful but drastic clauses of the rate bill, which both houses are so busy framing for our benefit. If we have a grievance it will be easier to make the railroad traffic manager understand it and induce him to apply the remedy than to explain the intricacies of our case and depend for relief on a commission in Washington.

Railroads Foster Great Industries.

The railroads may not have been always in the past as far sighted as their customers, and their officials have not always strictly obeyed the laws. But inasmuch as some of the most energetic, as well as the most able men in the country, now control them, if the public will not give them credit for common honesty or patriotism it cannot deny them the vice or virtue of self-interest (call it selfishness if you will), and this, not favoritism nor legislative compulsion, induces them to foster the great industries dependent on their roads. Moreover, and the rule has proved to be almost of universal application, the small shipper benefits by the advantage secured by his big wholesale neighbor and enjoys rates which otherwise his own scanty traffic would not permit the railroad to give him, for low freights are dependent on large quantities carried, and the enormous bulk of our business is one of the principal reasons why our railroads can furnish such cheap transportation.

It would be foreign to my purpose and improper in this place to discuss the accusations brought against the railroads, or rather against their officers, of fraud and favoritism, but it is not improper to direct attention to the extraordinary courage, energy and skill, as well as amount of capital which have been put into the building up of our stupendous railroad system, and to its vital influence on all our great industries, which have as a general rule developed with the same rapidity as the railroads on which they depend. Any check therefore given to the legitimate expansion of our railroads by ill-advised legislation and by creating disturbance of public confidence must react sensitively, not only on railroad securities, which is a small matter, but on our farming, our mining and all the other branches of national industry which depend on railroad transportation, and on whose prosperity conversely railroads depend.

Powell & Colne, 11 Broadway, New York, agents for the Tropenas converter steel process, have closed a contract with the Massachusetts Steel Casting Company, Everett, Mass., for a second converter.

Consolidation in the German Iron Trade.

The London *Engineer* discusses the tendency toward consolidations as successors to the present régime of syndicates in the German iron and steel trades. The steel syndicate, which has now been in existence over two years, expires next June, though negotiations are on for its continuance for 5 or 10 years. Some discord has appeared, and the situation as thus disclosed is commented on as follows:

In the case of the Westphalian Coal Syndicate, which would not be able to export a single ton of coal if it endeavored to meet the requirements of the inland market, the coal owners are at variance with the other proprietors who also have iron works, because the latter class use their own production of coal and coke as far as possible, and thus escape the payment on their own consumption of the levy made by the syndicate to defray its working expenses. The Pig Iron Syndicate is in a similar position, as those constituents which have steel works work up their output of pig iron as far lies in their power, and to this extent the supplies are diverted from the Düsseldorf Pig Iron Syndicate and are not liable to be charged with the administrative expenses of the latter. Then again some of those members of the Steel Syndicate who rely upon it, apart from individual production of semifinished steel, for additional supplies of this material, complain of inability to secure delivery of the quantity to which they are entitled under the agreement made in 1904. These are a few of the differences of opinion which prevail.

Expansion of Steel Works Capacity.

The fact that the German Steel Syndicate was originally constituted for a term of three years has had the effect in the time which has elapsed of stimulating the members to undertake large extensions of works with the object of securing, in the event of the renewal of the combination, a larger allotment than they already possess, both in respect of the first group of products as represented by semifinished steel, railway material and shapes, and of the second group, which comprises bars, plates and sheets, wire, tubes, castings, forgings and other manufactures. But the extension of blast furnaces, steel making plant, rolling mills and other departments occupies a considerable amount of time, and will eventually not give to any particular works the special advantages which result from amalgamations of works, and which at once place a combination of two ahead of many of the others individually. Not only so, but where consolidations tend to create a self-contained unit or to enhance the strength of an existing self-contained unit, we find that this policy leads to the elevation of such works to a plane which will be practically unassailable should the Steel Syndicate fail to be renewed on its expiration in the middle of next year.

It is then this idea of being fully armed for the fray, combined with the differences which have arisen since the foundation of the syndicate, which is largely promoting the fresh movement in regard to concentration. The first to take action is the well-known Phœnix Mining & Iron Works Company of Ruhrort, which has a share capital of £1,750,000, and which has just made arrangements to absorb the undertaking of the Hoerde Mining & Iron Works Company, whose combined share and loan capital totals £1,800,000. The immediate effect of this amalgamation will be to place the Phœnix-Hoerde combination at the head of the Steel Syndicate from the point of view of allotment tonnage, a position which is now held by the German "iron king" as represented by the Deutscher Kaiser Gewerkschaft and Thyssen & Co. A second instance relates to the impending fusion of the Bismarck Hutte and the Bethlen-Falva Hutte, the latter passing over to the former, with the consent of Prince Henckel von Donnersmarck. It may be expected that these two instances will soon be followed by others of a similar character, especially as the period before the expiration of the Steel Syndicate agreement is now comparatively short.

German Finished Materials in Great Britain.

The special point to be observed by British iron and steel producers is that the pending amalgamations, following upon those which took place two or three years ago, are bringing into existence formidable undertakings which, when the present period of unprecedented inland demand is past, and irrespective of the question of the prolongation of the German Steel Syndicate, will exercise an important influence both in British home and colonial markets and in neutral markets from the point of view of competition. But the rivalry will be materially different from that which has prevailed in the past, and which has slackened or been suspended in recent months owing to the enormous consumption in the inland market of Germany. The competition of the near future, especially as a result of the expansion in the works in the industrial west of the Fatherland, will not be concentrated so largely on the dumping on our home market of semifinished steel as of finished manufactures. Our steel works will then not complain so much of cheap blooms, billets and sheet bars as of cheap bars, shapes, plates and sheets, tubes, rails—for the International Rail Syndicate will, in all probability, vanish next year—forgings and other manufactures. A great deal will, of course, depend upon the question as to whether British works are making preparations to meet this rivalry, and whether the supplies of iron ore, which the Germans are again endeavoring to secure in other countries, will allow of any further development, or whether they have nearly reached the limit of their capacity.

Engineers are finding that, apart from the merits of the steam turbine as a prime mover, its effect upon power plant design is to be far-reaching in the direction of simplicity and economy. Up to date turbines have been installed in plants more or less conventionally designed on the lines of reciprocating engine practice, but the typical turbine plant may be expected to show greater compactness of design, and much of the present complexity and expense will disappear. Two plants are now designed, for Fort Wayne, Ind., and Hamilton, Ohio, in which the boilers will be on the ground floor and the turbines directly overhead. The steam and exhaust runs will be both short and direct, the initial steam going up and the exhaust going down, as is proper. The exciters are placed upon the generator shafts, eliminating the use of separate exciting units, and as little as possible in the way of auxiliaries will be installed. There will be some saving in building construction, considerable in ground space, and the total economy, as compared with ordinary practice, is expected to approach 25 per cent.

A new searchlight recently submitted to the officers of the Swiss General Staff is reported to have proved a great success. It is stated that objects at a distance of 6½ miles were so brilliantly illuminated as to be readily visible through a glass. The machine providing the power is of 24-hp. and furnished 1,000,000 electric candle-power. A 40-hp. motor would have given, it is said, 12,000,000 candle-power. The diameter of the projector is 1 meter (39.37 in.). One great advantage of this outfit is that it can be readily handled electrically from a considerable distance, the tests including distances up to 200 meters (219 yd.). This enables the operator to send rays to any desired place without being himself blinded by the light or placed under the enemy's fire.

The rapid reconstruction of a trestle was recently carried on at Galveston, Texas. Fire destroyed 400 ft. of the long railroad trestle which extends from the mainland to the city, and stopped traffic. The construction forces and materials were immediately started to the work, and by midnight of the same day the trestle was sufficiently repaired to allow traffic to be resumed.

The Engineers' Society of Milwaukee, Wis., held its October meeting on the evening of October 10. James De Vry, mechanical engineer of the Chicago, Milwaukee & St. Paul Railroad, read a paper on "The Comparative Values of Compound and Simple Locomotives."

In the article on page 950 of *The Iron Age* of October 11, 1906, relating to the Hill iron ore deal, reference is made to the iron content of the base ore. This is 59 per cent., instead of 57, as there printed.

Steel Corporation Gas Engines.

A Total of 102,000 Horsepower for Blowing and Electrical Service.

Mention has been made in *The Iron Age* of several important contracts for gas engines let by the subsidiary companies of the United States Steel Corporation. It has been thought that a presentation of the entire gas engine programme of the corporation subsidiaries would be of interest as indicating the extent to which the utilization of blast furnace waste gases will be carried at the various plants. The total of the installations now being made and those for which appropriations have been allowed is 44,000 hp. of blowing engines and about 58,000 hp. for driving generators. This means that approximately 10 per cent. of the Steel Corporation's power will be supplied by gas engines, since it is computed that 400,000 hp. is utilized at the corporation's blast furnaces and 600,000 hp. at its steel works and rolling mills. All the new engines will utilize waste blast furnace gases with the exception of three smaller ones of 1600 hp. all told, namely, those to be installed at the Worcester, Mass., and Trenton, N. J., plants of the American Steel & Wire Company, and at the Pencoyd, Pa., works of the American Bridge Company. Below is given a complete list of the installations now under way or definitely ordered.

Carnegie Steel Company.

At the Edgar Thomson Works two gas driven blowing engines of 2000 hp. each are being installed to take the place of steam blowing engines for supplying blast to the F and G furnaces at Braddock. An order has also been placed for three gas driven 800-kw. generators for increasing the capacity of the electrical station at the Edgar Thomson Works.

The two new furnaces of the Carrie plant of the company now in course of erection will have their blowing engine equipment between gas engines and steam engines. The four proposed gas engines will have a total of 8000 hp. Two gas driven electric generators of 2000-kw. capacity each will be provided at the blast furnaces to generate current for the Homestead Works of the company located across the river.

For the Ohio Works of the Carnegie Steel Company, located at Youngstown, Ohio, an order has been placed for a gas engine driven 1000-kw. generator, to supply current to the Union mills of the company, located in the same city.

In connection with the two new Duquesne blast furnaces, for which an appropriation was made last week, four gas blowing engines of a total of 8000 hp. will be installed. An order will be placed also for three 2000-kw. gas engine driven generators. They will supply current for driving part of the Duquesne mills, thus displacing a number of small engines with motors.

American Steel & Wire Company.

A gas engine driven generator has been ordered for the Central Furnaces of this company at Cleveland, Ohio. It will be of 1000-kw. capacity and will generate power for use at the Newburgh Steel Works of the same company, distant 6 miles from the furnace plant. The American Steel & Wire Company has also ordered for its Worcester, Mass., works a 500-kw. generator driven by a gas engine supplied with producer gas. At the Trenton, N. J., plant a 300-kw. generator is being installed and its gas engine will employ producer gas. Both these latter installations are to increase the capacity of the present electric power stations at the two plants.

Illinois Steel Company.

This company has ordered two gas engine driven blowing engines of 2000 hp. each, to replace part of the steam equipment at the South Works. It is also installing at the same plant a 2000-kw. generator driven by a gas engine to provide for the expansion of its electric power station. Some of the new mills being installed at the South Works will be motor driven, taking the current from this power station. Surplus gas from the South Works blast furnaces will be employed.

For its Bay View Works at Milwaukee, Wis., the company has ordered a gas engine driven generator of 500-kw., to be operated by blast furnace gas from the Bay View stacks. It will provide the additional electrical power made necessary by recent improvements at these works.

Indiana Steel Company.

The most conspicuous gas engine installation of the Steel Corporation is at the new Gary, Ind., plant of the Indiana Steel Company. The four 600-ton blast furnaces will be driven by gas blowing engines, of which eight of 2000 hp. each are provided. There will also be an ample reserve of steam driven blowing engines. The surplus gas from the blast furnaces will also operate through gas engines nine 2000-kw. generators. Many of the new mills to be installed at Gary will be motor driven. The Gary plant will be connected electrically with the South Works of the Illinois Steel Company, by wires carrying high tension current. These plants are about 20 miles apart and midway between them is located the Buffington cement plant of the Illinois Steel Company. This latter is now operated by electrical current from the South Works, but when the installations at Gary are completed it will be in position to get current from either the Gary or the South Works. The arrangement will also enable either steel plant to assist the other in an emergency.

National Tube Company.

For the new blast furnaces at the McKeesport Works of this company, an appropriation for which was made last week, two gas blowing engines of 2000 hp. each will be provided. For the extension of the power plant at the same works two 1000-kw. generators driven by a gas engine will also be installed.

American Bridge Company.

At its Pencoyd, Pa., works, the American Bridge Company is erecting a gas engine of 400 hp. to employ producer gas. It will drive a centrifugal pump, which will displace a number of old duplex steam pumps now supplying water to the plant.

The United States Fairly in the Field.

The gas engines referred to above have been ordered from the Allis-Chalmers Company, Milwaukee, Wis.; the Westinghouse Machine Company, Pittsburgh, Pa.; the Snow Steam Pump Works, Buffalo, N. Y., and the William Tod Company, Youngstown, Ohio. The total outlay for engines and generators is several million dollars. As the greater efficiency of the gas engine as compared with the best type of steam engines has now been pretty fully demonstrated, it is the expectation that these various installations will effect considerable economies in the production at the various plants employing them. Though it is considered by the Steel Corporation engineers that the gas engine has passed the experimental state, the majority of the above installations are nevertheless fortified by spare steam equipment to provide for emergencies. The distribution of gas engines among a number of the Steel Corporation subsidiaries and their application to a variety of lines of service are calculated to give within a comparatively short time reliable data as to the conditions under which gas power can be most advantageously employed. The placing of orders for various types of engines will in time give the corporation a body of facts as to relative efficiency.

The installation of these engines using producer gas should result in valuable information also in this important field. Both bituminous and anthracite coals will be utilized in the manufacture of producer gas, so that full details of the performance of the respective producers will be secured. For the bituminous coal operation a down draft producer will be installed.

At the recent London meeting of the Iron and Steel Institute carefully gathered statistics were presented showing the extent to which large gas engines have been introduced at iron and steel and coke works in Germany, Belgium and Great Britain. On behalf of the Cockerill Works it was stated that the total of Cockerill engines ordered for blowing and electrical service was 63,155 hp., while other companies working under licenses had built 113,000 hp. additional. A company which had acquired licenses for the construction of the Körting engine in Belgium was reported to be installing two engines of this

type at the blast furnace of Grivegnée. At German iron and steel works it was reported that 349 gas engines with a total of 385,000 hp. were in use or ordered. The statement concerning large gas engines in England was that in all lines of service the engines over 500 hp. in use or ordered numbered 119 of 96,085 hp. Of these engines only four will use blast furnace gas and three coke oven gas.

With 105,000 hp. of gas engines ordered for the Steel Corporation and 40,000 hp. in use at the works of the Lackawanna Steel Company, it would appear that in comparison with the European countries which have pioneered in the employment of gas engines to utilize blast furnace gases the United States makes a better showing than has been commonly understood.

Customs Administrative Legislation.

WASHINGTON, D. C., October 15, 1906.—Considerable anxiety has been felt by importers and exporters interested in our trade relations with Germany as the result of reports published in the daily press with regard to the activities of certain representatives of German commercial interests, who, it has been stated, have complained to President Roosevelt and to officials of the Treasury Department that the United States has failed to carry out the pledges given last spring as the result of which application to American products of the maximum duties of the new German tariff was postponed until July 1, 1907. While these reports have been exaggerated, nevertheless the incidents referred to, taken in connection with the systematic agitation of the subject by German manufacturers and exporters, will have the effect of stimulating the interest of the Senate in the measure now before the Finance Committee providing for the comprehensive amendment of the customs administrative laws, and much confidence is expressed here in the passage of this bill early in the coming session.

It is reported here on excellent authority that the Senate Finance Committee, which was authorized to hold sessions during the recess of Congress, will meet some time in November to examine the Payne customs administrative bill with a view to its passage—possibly in an amended form—early in the coming session. The bill is regarded as of so much importance as to demand very careful examination. It is a composite measure embodying not only the suggestions of the German Government approved by the Secretaries of State and of the Treasury, but also a series of important features strongly urged by the Board of General Appraisers and by the Merchants' Association of New York.

Features of the Bill.

The two features of the bill which Germany especially desires to see enacted are embraced in amendments to Section 7 of the customs administrative act of June 10, 1890. The first of these permits an importer "at the time when he shall make and verify his written entry of such merchandise, but not afterwards, to make such addition in the entry or such deduction therefrom to the cost or value given in the invoice or *pro forma* invoice, or statement in form of an invoice, which he shall produce with his entry, as in his opinion may raise or lower the same to the actual market value or wholesale price of such merchandise at the time of exportation to the United States, in the principal markets of the country from which the same has been imported."

The innovation here consists in permitting the importer to deduct from, as well as add to, his invoices to make market value. The existing law requires him to pay duty on a valuation which in no case shall be less than that stated in the invoice, but which in the case of purchased goods must be as much greater as will equal the foreign market value of the goods on the date of shipment. This concession has long been demanded by many importers, but Congress has hesitated to grant it lest it should open the door to fraud or unduly increase the labors of the customs authorities and the Board of General Appraisers.

The second feature of importance to the German exporting interest embodied in Section 7 is the provision that additional duties shall not be assessed upon undervaluations which do not exceed 5 per cent. In the original customs administrative act a 10 per cent. margin was employed, but in practice it was found that many importers took advantage of this margin and habitually invoiced their goods at 10 per cent. below the proper figures. Nearly all authorities agree, however, that a margin of 5 per cent. is necessary to cover the varying valuations of experts, who frequently and in entirely good faith disagree by that amount.

Changes Desired by Department.

Aside from the modifications referred to, which appear to be desired not only by those interested in the German trade but by importers generally, there are several other proposed changes that the Finance Committee will scrutinize with great care. The Treasury Department is very solicitous for the adoption of the provision that there shall be no forfeiture of imported goods unless the appraised value exceeds the entered value by more than 100 per cent. The present limit is 50 per cent. and inasmuch as it is necessary to show fraud in order to bring about a forfeiture—an exceedingly difficult thing to do—the examiners and appraisers are strongly disposed not to advance invoices above 50 per cent., contenting themselves with additional duties collected on that basis. By increasing the limit to 100 per cent. it would be possible to collect much higher additional duties without incurring the necessity of instituting proceedings to forfeit the importation.

A feature of the Payne bill which has been very strongly urged by importers as a class, and which would also be most acceptable to the German Government, is the provision authorizing appeals from the Board of General Appraisers to be carried directly to the U. S. Circuit Court of Appeals, thus ignoring the Circuit Court and reducing the average period of litigation. This provision also requires that all the testimony in the case shall be produced before the Board of General Appraisers, which would put an end to the present practice of holding back important facts for the consideration of the U. S. Circuit Court, a practice that frequently causes serious embarrassment to the Board and to the Government.

Outlook for Action.

Numerous efforts have been made in the past nine years to amend the customs administrative laws in more or less important particulars, and as readers of *The Iron Age* are aware, several bills have been acted upon by the House but ignored by the Senate. In view of the international aspect of the question involved, which is of interest to all important foreign countries, and of the desire of the Senate leaders to co-operate with the Administration in avoiding a tariff war with Germany, there is good reason to believe that the principal features of the Payne bill will be enacted into law early next winter.

W. L. C.

The Co-operative Electrical Development Association, Cleveland, Ohio, has published a 32-page pamphlet, which gives many detailed applications of electric current indexed under various lines of business. The purpose of the publication is to promote the use of the electric current by the public for light, heat and power as both an end in itself and a means to the increased demand for electrical apparatus and supplies.

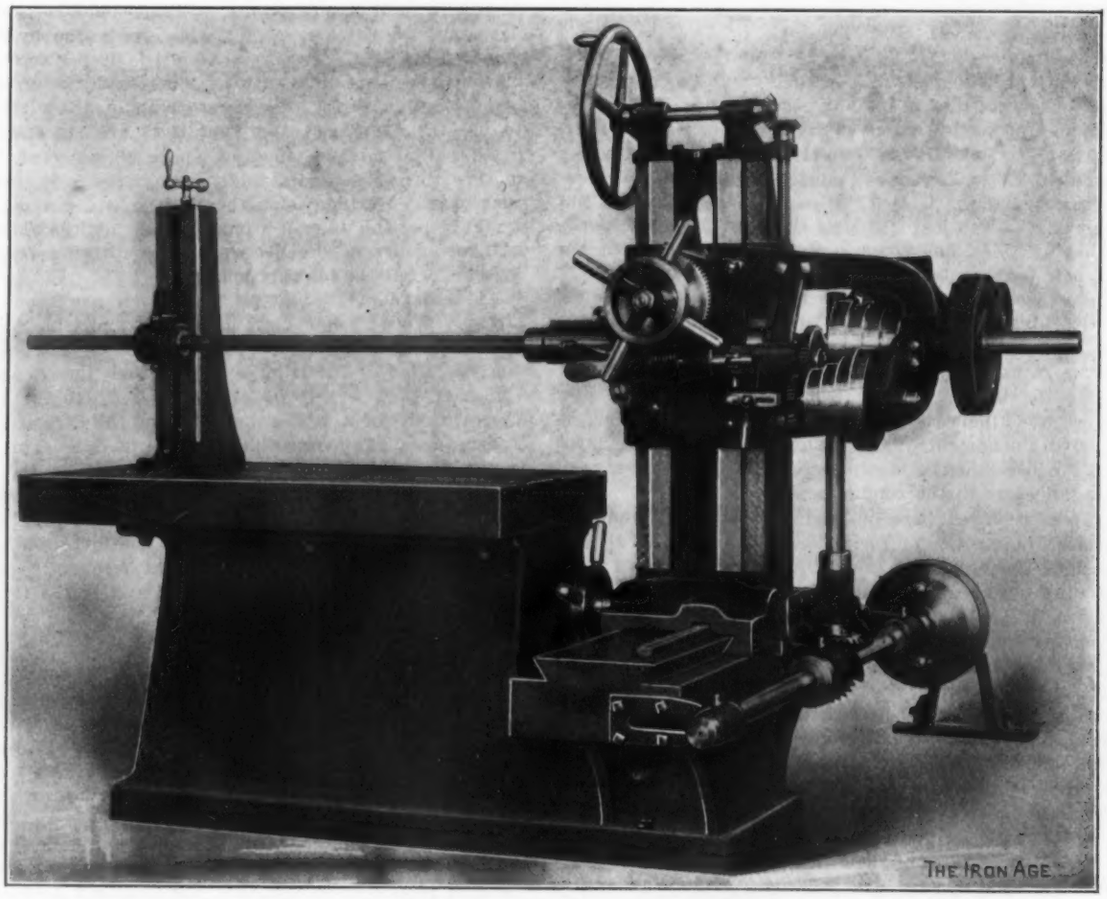
The headquarters of the gas producer department of the Morgan Construction Company were moved October 5 from 40 Exchange place, New York, to Worcester, Mass., where the main office and works of the company are located. This change was necessitated by the large volume of work now in hand. E. A. W. Jefferies will continue in charge of the department.

The Electrical Trades Exposition Company announces that the second annual electrical show will be held under its management at the Coliseum, Chicago, January 14 to 26, inclusive, 1907. Headquarters of the company are at 1006 and 1007 Monadnock Block, Chicago, Ill.

The New B. F. Barnes Horizontal Drill.

A new machine just placed on the market by the B. F. Barnes Company, Rockford, Ill., is the No. 2 horizontal boring, drilling and tapping machine herewith illustrated. On this machine it is stated that the various operations of drilling, boring, tapping, reaming, facing, &c., for both light and medium heavy work can be done conveniently and economically. The machine is described as strong, rigid and powerful, and particularly adapted for such work as cannot be done to advantage on an upright drill. The spindle can be used at any point over a surface 36 in. long and 18 in. high, and when it is desired the machine may be equipped with a boring bar support, as shown in the illustration.

The driving cone is fitted with internal back gears, the arrangement being one which was brought out by this company some time ago, and the spindle has power feed and an automatic stop, as well as a wheel for feeding by hand. All clamping levers and adjusting hand wheels are conveniently located and are readily accessible to the operator from the front or working side of the machine. The machine is normally intended to be driven from a reversing friction countershaft which is supplied with it.



The No. 2 Horizontal Drilling, Boring and Tapping Machine Built by the B. F. Barnes Company, Rockford, Ill.

Among the principal dimensions of the machine are the following: Hight over all, 5 ft. 10 in.; diameter of spindle, 2 1-16 in.; travel of spindle, 19 in.; vertical travel of head, 18 in.; hight of table from floor, 30½ in.; distance from nose of spindle to table, 6 in.; horizontal travel of column, 36 in.; area of table, 24 x 48 in.; taper in spindle, No. 5.

The machine occupies a floor space 7½ x 8½ ft., and weighs approximately 3800 lb.

Official reports of pig iron production in Germany and Luxemburg in August give a total of 1,064,957 metric tons, against 1,041,447 tons in July, 1906, and 968,323 tons in August, 1905. The August product consisted of 180,654 tons of foundry iron, 39,066 tons of Bessemer, 692,871 tons of basic, 80,906 tons of spiegeleisen, &c., and 71,460 tons of forge. It is entirely probable that the output of pig iron in Germany this year will exceed 12,000,000 tons and thus make a record, every month but February having gone above 1,000,000 tons.

Tiny Tubing.

A diminutive souvenir that attests a great achievement has been received from the Ellwood Ivins Tube Works, Philadelphia. The inclosing envelope bore the statement, "Here's a small tube," and it is well that it did, for there was nothing in the shape or weight of the package to indicate it. However, inside, mounted on a card like a stickpin, was the tube. There is no need to illustrate it, for any reader can represent it for himself by drawing a straight line with a medium sharp pencil, or if he is not enough of an artist for that he may picture it in his mind by imagining a needle with a longitudinal eye running its length instead of a transverse one through one end. For those who can think in such small dimensions it will carry some meaning to say that the outside diameter is about 0.025 in. The editor's tool box lacked an instrument for measuring the bore.

This tubing is no new product, for it has been made by this company for some years, but it will be a long time before it ceases to be a curiosity to the layman. What is also remarkable is that it is made of the highest grade of tool steel and may be tempered in oil. It is seamless tubing made from the solid bar and in lengths of 75 ft. or over. Its principal use is in the making of hypodermic needles, the after operations consisting mainly of pointing and tempering. The company's seamless tubing is made in sizes up to 2 in. or more in diameter, and in tool steel, low carbon steel, copper, brass, aluminum and in fact almost any metal. It is bright, smooth and clean and accurate in size to within one-thousandth of an inch. A sample of the tiny tubing may be had of the manufacturer by any one who would like to see it for himself.

More Sales of Ore Properties.

DULUTH, MINN., October 13, 1906.—The Tesora Mining Company has been developing a property in section 9, 58-16, Mesaba range, and has explored to the extent of about 2,000,000 tons. A deal has been made for the sale of this property, subject to the checking of an engineer who is now on the ground, for the hitherto unheard of royalty of $1 per ton. The purchaser is the New York State Steel Company, which is building Talbot open hearth furnaces at Buffalo and is arranging to erect blast furnaces in connection therewith. The ore of this property is to be mined underground, consequently there is no advantage to be derived from cheap mining, but the grade is good, averaging about 61 per cent. of iron and 0.039 per cent. of phosphorus, making it a desirable ore for the Bessemer converter. Talbot furnaces can stand most of the ordinary impurities aside from silica, and it is said this ore is quite low in it. With such a royalty ore can be delivered at Lake Erie ports for $3.40 to $3.50 per ton, this cost being about equally divided between the gross freight charge and the combined items of mining and royalty. The advent of the $1 royalty for Mesaba ore cannot be said to be proved by this deal, but it is much nearer than it ever has been, and it may be that in the near future no such exceptional circumstances as led to this transfer or to the Great Northern-Steel Corporation deal will be necessary to bring these royalties on high grade mines.

Several groups of small properties are being arranged for sale to Eastern steelmaking interests. These include what would have been considered very small mines, but aggregate a respectable tonnage. The Mayas Iron Company, which has been mining a tract of 200,000 tons on the east end of the Mesaba, has gathered in some other developed ore bodies, some of which are of from 200,000 to 300,000 tons, and is placing the group in the East. One large steelmaking interest has just taken over a piece of land in the center of 58-19, where the Steel Corporation had developed about 300,000 tons, on a basis that makes the royalty 35 cents per ton, of which 10 cents on the entire tonnage is paid in advance. There is considerable shifting about of leases and operating ownerships, and more activity is shown on the part of those not well supplied with ore than ever before.

Large Ore Deals of the Past.

In connection with the Great Northern-Steel Corporation ore deal it is well to correct certain wrong impressions that have been given currency. It has been said, for example, that the only deal the Steel Corporation has made in which a tonnage approximating the Great Northern deal was involved was that for the properties of the Union Steel Company. This is incorrect. Both the Chemung deal, which was made three years ago with Messrs. Congdon and Hartley and their associates, and the Canisteo deal, made with them a year ago, were larger than the Union purchase. These two deals took into Steel Corporation ownership more than 200,000,000 tons of ore—about four times the tonnage of the Union purchase—while the ore yet to be found on Chemung and Canisteo lands is likely to be of great importance. In both of these deals the selling interest reserved the right to continue explorations and to revise its minimums in accordance with the results, and in both a very great addition to original tonnage has already been made, as a result of which minimums are to be materially increased. These minimums were fixed with the understanding that they should be sufficient to exhaust the properties in 50 years. The Union lands included the Donora, Penobscot and Sweeney mines, the latter a small and unimportant deposit. Then, too, the figures of enormous tonnage on Great Northern lands, said to have been given by Mr. Hill in Eastern interviews, are not in accord with the understanding that Mesaba rangemen have of the tonnage actually shown as proved up and delivered. No one doubts that sufficient exploration may determine Mr. Hill's estimates to be correct, but it may be doubted to-day if there is more deliverable ore in such shape that it can be measured on Great Northern lands than is now known to exist on Canisteo properties.

General Mining News.

The Oliver Iron Mining Company is placing machinery at its Mesaba range mines suitable for electrical operation as soon as the Duluth Works of the Great Northern Power Company shall be in position to deliver power. This may be in the course of three months. Large compressors to supply air to all the Oliver Company mines at Eveleth have just been installed, and in these air cylinders have been placed between steam cylinders and cranks, thus interchanging their relative places, so that to use electricity the steam cylinders may be uncoupled and the compressors driven from motors. In the placing of new machinery in several of its important districts the Oliver Company will look to the time when power shall be electrically delivered.

A large amount of exploration has been done in the immediate vicinity of Grand Rapids, on the Mississippi River, in T 55-25, and several large ore bodies have been found. Some of these are the property of the Oliver Company and others belong to various companies and individuals.

The Cleveland-Cliffs Iron Company is to erect a central office for its mines in the vicinity of Princeton, similar to that recently completed at Negaunee. It will be of concrete, brick and stone, and will be fitted with business accommodations, as well as with rooms for social, physical and mental relaxations. Work begins soon and it is expected that the building will be ready for service early next spring. The same company is to sink an exploratory shaft on a new property two miles east of its Swanzey mines, where some ore has been found and where exploration underground can be conducted better by shafts and crosscuts than by drills. Its extensive works around Princeton are being pushed and a large amount of ore should come from there another year.

The old Ohio iron mine, near Michigamme, which has been idle for some years and not extensively operated since the early '90's, is once more alive. It has been decided by Rogers, Brown & Co., who now own it, to start operations there and preliminaries are under way. It is also said that the old Webster, belonging to the Cleveland-Cliffs Company, may resume. The two larger properties of the district, Beaufort and Michigamme, are not liable to resume for some time, if ever, even in these heyday times for old mines.

Shipments will begin at the Empire mine, near Cascade, in a few days, and it is hoped to move 50,000 tons this fall. All summer development has been in progress at the mine, and a large shaft has been sunk, drifts run and raises connected, and the sand capping stripped off. It is estimated that the mine can produce up to 250,000 tons in 1907, if desired. It is a low grade hard ore, desirable in many places.

Ore Shipments.

Iron ore shipments have continued very heavy, the unusually fine weather having aided railroads in getting ore forward, and the tonnage of the season will doubtless exceed my earlier estimates. The Duluth, Missabe & Northern Railroad, for example, has already passed its total product of last year, and is moving ore still at the rate of 50,000 tons per day. It has reached a total to date of about 8,900,000 tons and has about 2,300,000 tons to reach its expectations, which for a time were not within the apparent possibilities. Other roads have not done so much, and the old ranges are little more than holding their own.

D. E. W.

An estimate of 929,622,648 tons is given by London *Engineering* for the coal production of the world in 1905, as compared with 867,020,658 tons in 1904, showing an increase of 62,601,990 tons, or 7¼ per cent. The principal producers are credited with the following outputs: United States, 352,694,110 tons; the United Kingdom, 239,888,928 tons, and Germany, 173,663,774 tons. The Geological Survey's figures for the United States are 350,820,840 gross tons; the Mining Statistics Branch of the Home Department gives the total for Great Britain as 236,128,936 gross tons, and the Verein Deutscher Eisen und Stahl Industrieler assigns to Germany and Luxemburg a total of 173,796,674 metric tons.

Segregation in Steel Ingots.*

Effects on the Mechanical Properties of Steel.

BY J. E. STEAD.

The following is a general summary of the facts and conclusions arrived at by experimental research over a period of many years:

1. That segregation means the concentration of the more fusible portions of the steel into local centers, which are the last to freeze.

2. In solidifying, it has long been known that the crystallites which first fall out of solution are much purer than the residuum liquid, which is last to freeze. If such were not the case, segregation would be impossible.

3. The researches of M. Osmond, the late Sir W. Roberts-Austen, Dr. Stansfield and others have given us a fair approximate idea as to at what temperature the first crystallites fall out of solution. Dr. Carpenter and Mr. Keeling have demonstrated by experiment in a complete series of steels at what temperature the residual liquid freezes, and have shown that in proportion as the carbon increases up to 2 per cent. the difference between the first and final freezing points proportionately increases. Thus, approximately, the difference between the first and last freezing points is as follows:

Carbon. Per cent.	Difference between first and last freezing points.
0.5	48
1.0	96
2.0	192

4. According to the rule formulated by Professor Bakhuis Roozeboom, the carbon associated with the iron in the crystallites which first fall out of solution in freezing steel approximates to about 46 per cent. of that in the fluid steel before it begins to solidify. The rule, however, was formulated on the evidence afforded by the freezing of salts; and until the first crystallites of steel can be separated and analyzed, it cannot be regarded as exactly applicable to iron-carbon alloys. Evidence has been obtained by the writer which went far to show and prove that the first crystallites from steel with about 0.37 per cent. carbon, in an exceptional rail, were purer than the rule indicates. The heart of this rail only contained 33 per cent. of what was present in average steel.

Why Pure Crystallites Do [Not Separate Into Graduate Layers.

5. That the reason why the pure crystallites do not, under normal conditions, separate out into graduated layers, increasing in carbon with the increasing thickness of the freezing layers, is due to two main causes,— viz.:

a. On account of the mechanical entanglement of the mother liquor between the spines of the first crystallites and at the junctions of the complete primary crystals.

b. On account of the carbon diffusing out of the mother substance into the purer first crystallites during and after imprisonment.

6. It is only the small residuum of impure mother metal, not mechanically entangled, which eventually escapes and finds its way to the upper central axis of the ingot and constitutes the axial or major segregate.

7. Although segregated steel is generally understood to be that in which the impurity is concentrated in the upper central axis, yet steel may contain minor or local segregations in the positions described, as follows:

a. Near the outside envelope, where it exists in the blowholes, &c.

b. In the layers intermediate between the exterior layers and the central axis, either in blowholes or at the junctions of the large primary crystals.

8. The structure and the position of the major and minor segregations can be readily detected by etching the complete sections of ingots, bars, rails, &c., after they are polished on No. 1 fine English emery paper. The most rapid results are obtained by immersing the polished steel in a solution of 20 per cent. nitric acid and 80 per cent. water, and keeping it under the liquid until the contrasts of light and dark reach a maximum, when the steel is withdrawn, washed with hot water and afterwards with alcohol and ether. In steels in their natural unhardened condition the parts highest in phosphorus etch out very dark. The study of the structure of steels has led to the most recent knowledge regarding segregation.

Relative Positions of the Segregates.

9. The work of the most reliable authorities agrees in showing that, of the elements carbon, sulphur, and phosphorus, sulphur segregates most, phosphorus follows, while the carbon segregates least. The ratio is carbon: phosphorus : sulphur as 1 : 1.5 : 2. Silicon apparently does not segregate, but silicate of manganese is sometimes found in rather large quantities in the axes of steel ingots. Analyses by the ordinary method, of steel taken from such positions, would lead to the erroneous conclusion that silicon was present in excess and had segregated.

10. As manganese does not segregate with the sulphur, it appears probable that they are not in chemical union when the sulphur is in solution; but that as the sulphur does exist as sulphide of manganese in cold segregates, it would appear to indicate that they combine at or close to the point at which the segregate freezes, provided the manganese present is in sufficient quantity.

11. That a large part of the segregates in steel ingots is directly traceable to the formation of blowholes in the steel when it is in a pasty condition. The pressure of the evolving gas on the mixture of pure solid and impure liquid in which it forms must squeeze out some of the impure liquid, which, passing inward, ascends to the top of the ingot, or finds its way into previously formed blowholes.

12. The gases ascending from the solidifying walls of steel, as suggested by Professor Tetmajer, assist in sweeping the segregate to the top of the ingot; but according to Mr. Talbot's experiment it is shown that the segregated liquid is itself specifically lighter than the purer steel, and that it will ascend independently of the ascending gas.

13. It is probable that the ascending gases induce surface vertical currents and eddies in the steel near to the freezing surfaces, which sweep out the segregating liquid partly imprisoned between the projecting branches of the continually developing crystals.

To Reduce Segregation.

14. The researches of Talbot have proved that a minute quantity of aluminum added to fluid steel greatly reduces the axial or major segregation.

15. Experiments made at Eston by A. W. Richards have shown that silicon has a similar effect to aluminum.

16. The macro, or gross sectional structure of bars of soft and medium hard steel indicates that the blowhole segregations are absent in steel to which aluminum has been added.

17. As both aluminum and silicon make the steel quiet in the mold and more or less completely prevent the evolution of gases and the formation of blowholes in the steel when it is in a pasty condition, it seems certain that if there are no blowholes formed they cannot be the receptacle for segregates, and that, therefore, blowhole segregates become impossible. The pressure of the gas in making blowholes in nonaluminous or wild steel squeezes out the mother substance; but if such pressure is not exerted the mother substance will not be forced out. We must conclude, therefore, that the main reason why aluminum and silicon prevent or retard segregation is because they reduce the evolution of gases.

18. It has been stated that compression of fluid steel in the ingot prevents segregation. The writer has not had the opportunity of confirming this, but he considers that if the pressure is exerted sufficiently early so as to prevent the formation of blowholes, the segregation should be slight. If, on the other hand, blowholes form before pressure is applied the pressure will be liable to force some of the mother substance into them, and therefore minor segregation will be the result.

* A paper read before Section G of the British Association for the Advancement of Science, York, England, August, 1906.

Purer Metal at Centers of Ingots.

19. Several instances are on record where the lower central axes of steel ingots are much purer than the average of the whole ingots. One very marked case of this kind has been studied by the writer (previously referred to under paragraph 4). The rail contained practically pure steel in the center with carbon 0.125 per cent., while the outer envelope contained 0.37 per cent. This peculiar arrangement is explained by assuming that the cooling of the ingot had been retarded, that the segregate flowed up the walls of the freezing layers, that a descending current passed down the central axis, and in passing over the base layers deposited the first crystallites, the mother liquor being continually swept to the sides, which latter, cooling more quickly than the base, entangled a portion of it as it passed over the projecting crystallites, the balance of the segregate ascending to the upper central axis. In advancing this hypothesis it is assumed that if a stream of steel passes continually over a cooling surface at such a rate as to admit of the freezing of only the crystallites which form on the "liquidus curve," but not cooling so as to sensibly lower the temperature below their freezing point, there will be a continual accumulation of them and the remainder of the less pure metal would be carried away on each side of the growing deposit, an assumption which is quite consistent with the phase or equilibrium rule, as can be seen by studying the cooling curves of Messrs. Carpenter and Keeling.

20. Experimental evidence was given by the author to explain how it is that a laminated structure is found in medium soft steels after they had been forged or rolled. It was shown that if the pearlite area in the original steel consisted of large masses relatively wide apart, and if the forging was conducted at a temperature under 750 deg. C., the pearlite and ferrite would be obtained in disconnected bands or strings, and this would occur independently of the quantity of phosphorus present. It is shown, however, that the banded structure frequently observed by many investigators is due to the irregular distribution of the phosphorus. When the white ferrite lines contain a higher percentage of phosphorus than the pearlite in medium soft steels, on very slow cooling, although the carbon may have been initially, when hot, equally distributed throughout the mass, it leaves or diffuses out of the phosphorus parts into the iron containing a less proportion of that element. That this actually does take place was proved by welding together alternate layers of pure iron on the one hand and carbophosphide of iron on the other. After welding and very slow cooling carbon was found to be in the pure iron and none in the phosphorized part, thus establishing the very important law that phosphorized iron will not as readily hold carbon in solid solution as iron without phosphorus, or with less phosphorus.

Segregation and Mechanical Properties.

Opinion is divided on the question as to whether or not segregation causes premature failure of steel when in practical use. The following remarks summarize the result of about 30 years' study.

1. That a steel bar or shaft with a brittle core, if subjected to sudden shock, will bend only as far as the internal core is capable of deflection; and if the bending is carried beyond that point, the core will break, and the fracture once started will travel through the steel surrounding it. The bending power of the whole is, therefore, practically that of the core.

2. That if a segregation core is capable of only limited elongation under static tension, in any but very soft steels its extension will determine that of the whole section; for when the core gives way the fracture at once travels through the more extensible material surrounding it.

3. Similarly, when segregated wire rod is reduced in section by severe drawing through a cold steel plate, the core, or central axis, will break at intervals and the fracture will continue and pass through the envelope, yielding the well-known cup and cone fracture, but the cone will be truncated and the cups will have irregular bases. When the "cones" are complete and pointed, overdrawing, and not segregation, is usually the cause of fracture.

4. If the steel is very soft and contains plates or threads in any part of the section of what I have called "minor" or "blowhole" segregations, and which have been elongated or flattened during hot rolling or forging, such material, when extended, will usually give very satisfactory elongations; but if the extended piece of steel is sectioned longitudinally it will be found that the segregated parts have broken and that there are gaps or spaces between, along the threads. The fractured surfaces will, in such case, show minute local cup and cone depressions and prominences, and not infrequently the smooth polished sides of the extended test piece will have fine trains of herring bone fractures at short distances apart. It is by these indications one can be certain of the existence of minor segregations in forged steels.

5. That if the steel is required for rifle barrels a hard axial segregation is liable to cause the drills to deviate from a straight line and the barrels to be rejected as scrap.

Rails from Top Ends of Ingots.

6. That the rails made from the top ends of ingots (as has been proved by M. A. Pourcel, Sir Lowthian Bell, Mr. Thomas Andrews, and every steel rail maker) break more readily under the falling weight than the rails from the other parts of ingots, for reasons given in paragraph No. 1.

7. That, as a rule, the axial segregated parts of ingots, when rolled into bars, have a greater tenacity but less power to extend, when subjected to static tension, than the enveloping steel. When their tenacity is less than the envelope it is almost certain that the steel is unsound, or contains an excessive amount of slag inclusions, or sulphide and silicate of manganese.

8. Segregated plates are more liable to split and become unsound by shearing than unsegregated steel, and the segregated steel at the distorted and crushed edges separates into laminæ and the fractures sometimes travel some distance into the plates; and in such cases it is necessary to plane off a considerable quantity of this edge in order to arrive at a point where the material is sound. For this reason it is advisable not to use segregated steel for boiler plates.

9. That quite newly made steel is not infrequently unsound, owing to piping or slag inclusions at the very positions where segregation is at a maximum; and if such material fails when in use it would not be correct to say that segregation was the cause; it would be more correct to conclude that it was due to initial unsoundness.

10. That if segregation, apart from unsoundness, is really responsible for the premature failure of rails, axles, &c., one would expect to find among the fractured rails a preponderating proportion of them segregated.

11. That if we take Mr. Talbot's results as typical of what has constantly and regularly been obtained in steel ingots, when no aluminum has been used to produce dead melting, we must conclude that at least about one-fifth of the steel in the form of ship plates, girders, rails, &c., actually in use and giving perfect satisfaction, is more or less segregated.

Segregation and Broken Rails.

12. That, according to most reliable evidence, the number of rails which actually break when on the permanent way, in English railroads, averages about 1 in 20,000 per annum. The writer has not found, of those examined, that more than one-sixth of them were axially segregated, and in those which were thus segregated it was doubtful whether they were not initially unsound. The causes, in his experience, which were mainly responsible for failure, were unsoundness, either internally or externally. Indeed his conclusions coincide generally with those of Mr. Job, chemist to the Philadelphia & Reading Railroad, who attributes the greater proportion of the failure of rails to unsoundness resulting from honeycombing and piping, and states that comparatively few failures are due to excessive segregation. Yet it may be accepted as a fact that one in five or six rails in use is segregated. If we accept the suggestion that there is one

segregated rail in five on British railroads, and that one in six broken rails is segregated, then only one segregated rail in 60,000 rails per annum breaks, and it is almost certain that in this segregation is not always responsible for failure. It seems, therefore, that although segregation should be avoided it is not nearly such an evil in rails as is maintained by some authorities, unless accompanied by unsoundness. Unsoundness without segregation will equally lead to premature failure. Steel makers are fully alive to the importance of making sound metal, but they know that there is always the liability of producing piped steel when taking precautions to produce soundness.

In the opinion of the author compression of the liquid steel in the mold is the only reliable method of producing perfectly sound material, but much advantage can be obtained by the judicious use of either aluminum or silicon.

Disston Stone and Metal Saws.

With a Few Words on General Saw History.

As far as can be learned the first saws of any kind manufactured in the United States were made by William Rowland, who started in business in Philadelphia in 1806. In 1823 Aaron Nichols also started a small plant in Philadelphia. In 1828 or 1829 R. Hoe & Co., New York City, began making circular saws from English steel, which were about the first circular saws made in this country.* Noah Worrell started in New York about 1835 to make trowels and small circular saws. In 1836 William & Charles Johnson commenced the manufacture of saws in Philadelphia and it was with this concern that Henry Disston learned his trade. In 1840 this firm failed and Disston accepted from them some tools, steel and other material on account of wages, and started to manufacture saws in his own name. Later several small industries were founded by Jonathan Paul in 1840, J. Bringhurst in 1842, James Turner in 1843, and Walter Cresson in 1845, all of which were ultimately bought out by Henry Disston. William Andrews was one of the first saw makers in this country and his nephew still possesses an anvil brought here by his uncle in 1819. This is said to be the first saw anvil used here.

Inventions on saws and machinery for manufacturing them have been numerous and varied, consisting chiefly of patents on style, grinding machines, toothing machines, tempering machines, &c. Henry Disston & Sons are continually experimenting with the view to improving their product and have secured many patents on saws, machinery, &c. During the past year, 1905, they have spent over $50,000 in rebuilding their hardening shop, and on April 24, 1906, they put into successful operation the first electric furnace of the kind installed in the United States for melting of crucible steel.

The band saw was probably conceived as early as 1808, by Wm. Newbury, but for 40 years it was regarded only as a curiosity. Some time after the close of the war about 1866 or 1867, Henry Disston went to Paris, where he learned of a new band sawing machine and

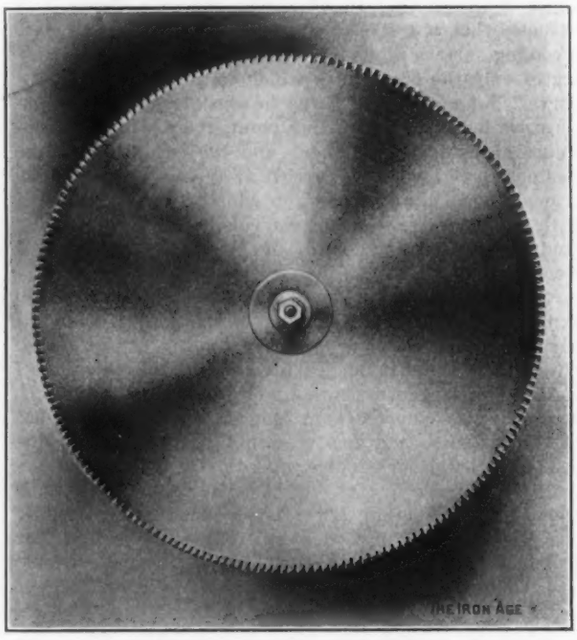


Fig. 1.—Disston Inserted Tooth Circular Stone Saw with Diamonds Embedded in the Teeth.

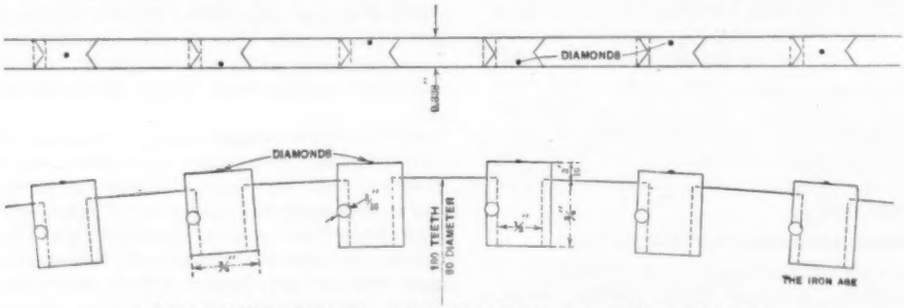


Fig. 2.—Detail of the Stone Saw Showing Positions of the Diamonds.

Prior to 1855 all of the crucible steel used in the manufacture of saws was brought from England. In that year Henry Disston built and operated the first successful crucible steel melting plant for saw steel in the United States. The crucible steel so made was hauled to Frankford, there rolled into sheets and taken back to the works to be made into saws. After several years of successful experimenting Disston built a rolling mill, and since that time has made his own saw steel.

Up to this time the American market was supplied almost entirely by foreign saw manufacturers, but since then the growth and development of this business in the United States has been phenomenal. Now and for some years past practically no saws of foreign manufacture have been imported into the United States, while on the other hand American made goods are exported very largely to all parts of the globe.

brought back two of them. The blades were ⅝ in. wide, and with the larger of the two machines there were some wider saws. These were the first band sawing machines in this country, so far as is known, and when they were first installed they aroused much curiosity. It took some time to overcome the men's disinclination to run them for fear of the saw breaking and cutting off their arms. These machines proving successful, two more were soon installed which were made in this country. The first band sawing machines had frames similar in form to those now in use and the later improvements were mainly in the guides and tightening mechanism.

The 6-in. band saws exhibited by Henry Disston & Son at the Centennial Exposition in 1876 were looked upon as great curiosities. Considerable trouble at that time was experienced in running what were then termed wide saws. At the present time the same company is making band saws as large as 18 in. wide, 64 ft. long and also 17 in. wide, 53 ft. long, with teeth on both edges so as to cut both ways, which are said to be the largest saws of the kind ever made.

* The first patent issued for a saw in the United States was to L. R. Bump, in 1828, for a barrel saw. A mulay saw was patented in 1832. The first circular saw was patented by L. Hitchcock in 1833. A bilge saw with inserted teeth was patented in 1835.

Inserted tooth circular saws for cutting metal have been made by this company as large as 87 in. in diameter, 1 in. thick, cutting a kerf of 1 3-16 in., the teeth of which were made of air hardened steel and were adjustable in the blade. This saw was made in 1893 and was considered the largest of its kind in this country at that time. In 1905 the company made the largest inserted tooth circular stone saws ever manufactured. They were 100 in. in diameter, 0.338 in. thick, weighed 800 lb. each, and contained 180 teeth, in each of which was embedded a diamond for cutting purposes. One of these saws is illustrated in Fig. 1. The position of the diamonds varies on succeeding teeth after the manner indicated in Fig. 2—that is, some are at the center and some are on opposite sides of the cutting faces of the teeth. By this arrangement the diamonds act as roughing out points and the intervening ridges of the stone are readily cut down by the steel teeth. Each tooth is held firmly in the blade by a 3-16 in. steel pin, and the teeth may be easily renewed when worn, damaged or broken. Very satisfactory results with these saws on various kinds of stone are reported, in some cases an average cutting speed of 16 in. per min. being obtained. The weight of this saw, some 800 lb., conveys very clearly its great size. In addition to circular saws of this type, saws for horizontal and vertical work with diamond set inserted teeth are also being made by the Disston works.

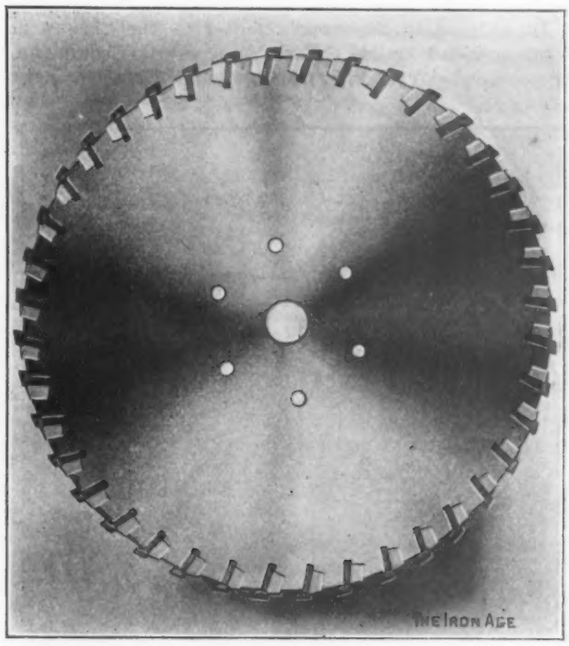


Fig. 3.—Disston Premier Inserted Tooth Metal Saw.

Another new type of circular saw for metal sawing has also been recently placed on the market by this company. This is termed the Disston Premier inserted tooth milling saw, shown in Fig. 3. As early as 1893 this company made an inserted tooth saw with adjustable teeth as large as 87 in. in diameter, the blade being 1 in. thick and cutting a kerf of 1 3-16 in., which was doubtless the largest of its kind in the country at that time. The teeth of the Premier saw are made of high speed steel and are held in position by taper wedges tightened by screws as shown in Fig. 4. An adjusting screw at the base of the tooth socket in the blade is used in setting and holding the teeth accurately to uniform hight. These saws are made regularly in sizes from 18 to 60 in. in diameter, the former having 22 and the latter 74 teeth. The thickness of the blade varies from 5-16 to ¾ in.

A 32-in. saw of this type having 40 teeth made a record of cutting 1275 sq. in. of 0.40 carbon steel, at a peripheral speed of 66 ft. per min. with a feed of from 1 to 1¼ in. per min. All the teeth after performing this work were in perfect condition, and a large amount of additional work was done, of which, however, no record was made, without requiring any sharpening of the cutting teeth. Saws of this type are particularly adapted for use in steel foundries and for the sawing of beams, bars, girders, forgings, &c.

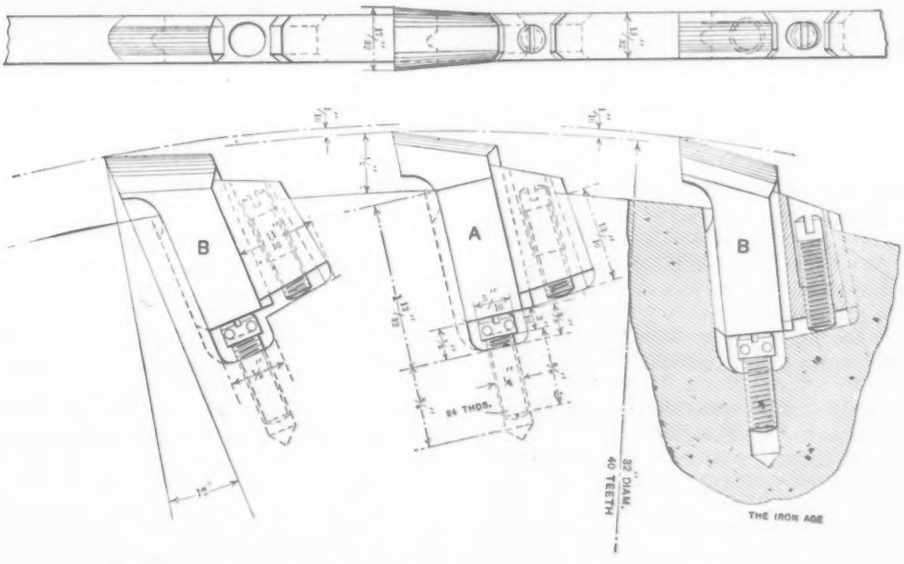


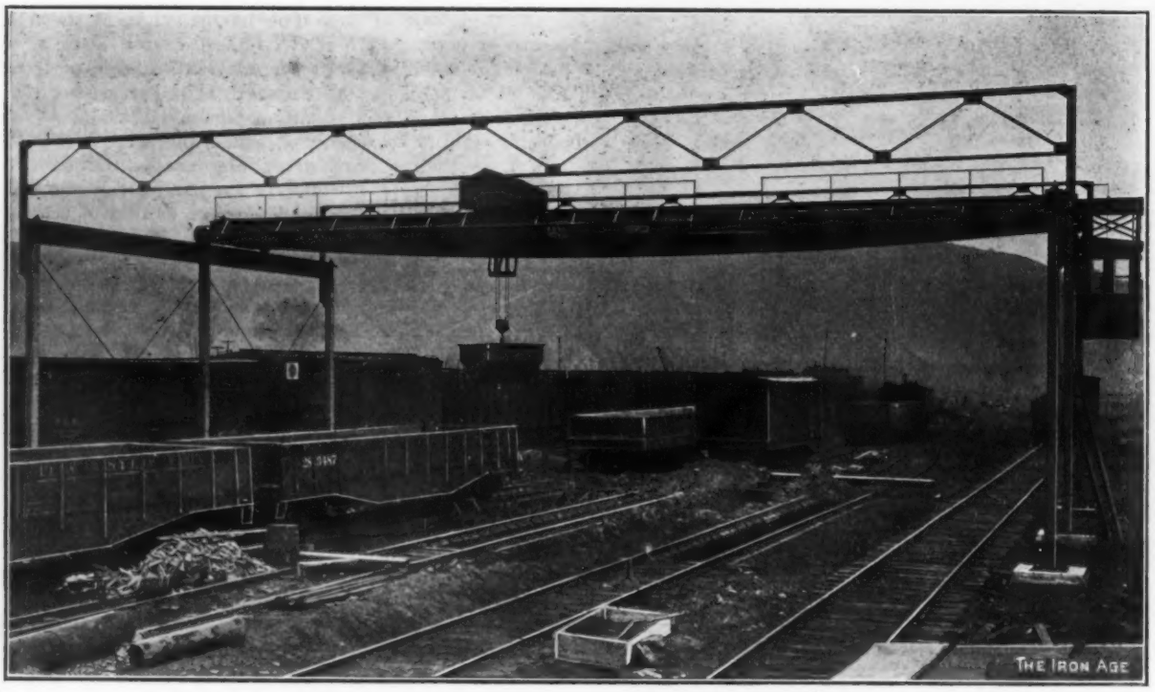
Fig. 4.—Detail of the Metal Saw Showing the Manner of Securing the Teeth.

In the system of fire control and direction adopted by the National Coast Defense Board a powerful telescope is located at each end of an accurately measured base line about 2000 yards long. Electrically connected clocks sound a bell at regular intervals in each of these two stations, when an observation of the angle of the target is made and transmitted by telephone to the main station, where the information is plotted upon a large scale chart and the range and direction from any given gun determined. This information is then corrected for the various ballistic incidents affecting the flight of the projectile, such as temperature, humidity, direction and force of the wind, &c., and the corrected data sent to the gun. The rapidity with which this is done is remarkable, for observations are made every 20 seconds, and the gunner informed each time of the exact location of the target, so that the gun may be kept constantly trained in such position that the projectile will reach a given spot at the same instant as will the target. This, it is seen, takes account of the speed with which the target moves.

A Case Plant for Handling Locomotive Ashes.

An example of the use of an electric traveling crane for accomplishing the work that is generally imposed on a conveyor of one form or another is shown in the installation of a plant for the disposal of locomotive ashes in the yards of the Pennsylvania Railroad Company at Dennison, Ohio. The service required of the crane is the transporting of ashes from pits beneath the tracks to cars provided for removing them to the point of final disposition. It will be seen that the operation is very rapid and economical, besides being very flexible, as any number of tracks may be covered and by providing a runway of suitable length a large area may be traversed by the trolley, thus obviating the necessity of shifting cars while loading.

In this instance the crane, which was built by the Case Mfg. Company, Columbus, Ohio, has a capacity of 3 tons and a span of 72 ft. It extends across four tracks, two of which are provided with pits where the locomotives deposit the ashes into specially made buckets. These are placed between the rails, being supported by flanges which rest on the side walls of the pit. When the buckets are full the crane hook is inserted in a ring provided at the top of the bucket and the latter is then hoisted from the pit and transferred to a point above the car in which the ashes are to be deposited. It is then dumped automatically by hoisting it to the limit of the travel.



An Ash Handling Plant for Locomotives Installed for the Pennsylvania Railroad at Dennison, Ohio, by the Case Mfg. Company, Columbus, Ohio.

The accompanying illustration shows the automatic dumping device, though rather indistinctly. A heavy wrought iron ring is rigidly supported from the crane trolley, and this ring is of sufficient diameter to allow the bottom block and hook to pass through it. The bucket is provided with a pair of levers so arranged that by striking the ring they are bent downward and disengaged, allowing the bottom of the bucket to open and discharge the contents.

To avoid any possibility of damaging the hoisting mechanism when the bucket strikes the ring a device is provided to prevent the sudden stopping of the motor and to allow the mechanism to come gradually to rest. It consists of a friction coupling connecting the two ends of one of the shafts in the hoist mechanism. Any desired lifting power may be obtained up to the full capacity of the crane, and when the torsion in the coupling is increased beyond that for which it is adjusted, by reason of the bucket levers coming in contact with the dumping ring, the driving half slips in its contact with the driven half, allowing the motor to revolve until it is brought to a gradual stop after the current is cut off, which is done by an automatic limit switch.

The crane runways consist of two spans supported at each end by single leg columns. The end thrust due to the starting and stopping of the trolley is taken care of by light trusses connecting the opposite columns at each end, and this design obviates the use of A-frame columns, thus saving considerable space between the tracks. The end thrust of the bridge is transferred to the piers at the bases of the columns through diagonal rods connecting the tops and bottoms of adjacent columns. The operator's cage is located outside of the runway, in order not to interfere with the passing of trains underneath the crane.

In addition to the crane referred to the Case Mfg. Company also installed a similar one at Harrisburg, for the same company. This machine is of 5 tons capacity and 46½-ft. span, with the cage located at the center of the bridge.

The Industrial Chautauqua Association, with headquarters in Chicago, announces a movement for the improvement and development of local industrial and commercial conditions. The Industrial Chautauqua Association gathers material regarded as helpful in awakening interest in industrial development and presents it in the form of lectures. The arrangement proposed is for a week of lectures, afternoon and evening, in each town to which the movement extends. One of the problems on which the association offers help is the devising of methods to keep buyers at the home town. George Landis Wilson, who is at the head of F. Cortez Wilson & Co., Chicago, is president and treasurer of the association, and Edwin W. Woodcock secretary and manager.

A revision of the general tariff laws of the United States and better reciprocity with foreign countries, especially England and Canada, was demanded in a resolution adopted by the National Association of Agricultural Implement and Vehicle Manufacturers in Chicago on October 11, at the closing session of its thirteenth annual convention. Jamestown, Va., was selected as the meeting place of the 1907 convention, and H. E. Niles, Racine, Wis., was elected president.

Wealth in Old Mexican Bells.

DURANGO, Mexico, October 6, 1906.—A few years ago when treating of the opportunities which exist for expanding American trade in Mexico the subject of church bells was referred to, and the belief expressed by the writer that if some of the leading manufacturers of those articles would send competent Spanish speaking representatives here to canvass the church authorities thoroughly there was a good prospect that the experiment would prove a profitable one. It was pointed out that churches are very numerous, both in the cities and in the country towns, and that in the belfries of nearly all of them are hung from one to half a dozen bells, the majority of them being cracked and out of tune and only fit for the melting pot. It was also said that the people of Mexico, like their brethren of the Latin race everywhere are musical and dislike discord—at least discord of sound—and for this reason give professional and itinerant pianoforte tuners who chance to come along a cordial welcome, and generally an opportunity to demonstrate their technical skill by permitting them to retune too strenuously thumped pianos. It is reasonable, therefore, to infer that eloquent salesmen for bell foundries would receive a like kindly reception from the congregations and, in all probability, from the church dignitaries also, providing, of course, that they could speak to them in their own language and were in every respect competent to solicit orders in their special line of selling church bells.

Whether the suggestion referred to was taken to heart by any manufacturer of bells in the United States the writer cannot say. The subject is recurred to this time in consequence of a new cause having developed which adds weight to the arguments at that time advanced in support of the belief that a large number of the existing church bells would be replaced by new ones were the right kind of commercial missionaries sent into the field to advocate the reformation.

It has been ascertained that considerable quantities of the precious metals, gold and silver, have entered into the composition of the alloys from which probably a great many of the old Spanish bells were cast. To realize from this unexpected source of wealth at least one of Mexico's church congregations, after a long struggle among its members, has dismantled and now offers for sale a large bell which is famous not only on account of the gold and silver which it contains but also for the fact that it has faithfully fulfilled its function of calling worshipers to prayer for three centuries. A bell of modern make is to be substituted for this veteran, whose remains are not to be lightly thrown aside; on the contrary, its dissolution and the skilful separation of the metals contained in its make-up will be both interesting and profitable to its owners. The Church of San Juan, from which this bell has been removed, is situated in the city of Aquas Calientes. The history of the bell, on account of its age and intrinsic value, is well worth recounting, the more so in a material age, since it demonstrates the fact that in the day of its manufacture gold and silver were not deemed metals too precious by the pious to permit of their free appropriation to sacred uses.

The writer has taken the liberty to condense the following description of the bell and its history from an article which appeared in the Mexican *Herald* of October 1, from its special correspondent in Aquas Calientes.

Since it has been decided to sell the old relic, which was set to swinging in the first church erected here after the conquest of this country by Cortez, a number of borings have been made into the bell to determine its worth. These show that it is very rich in both silver and gold, and its value has been conservatively placed at $2000. The weight of the bell is almost a ton, and as the assays show that it contains nearly 2 per cent. silver it holds $800 worth of the white metal alone.

The date of the casting of the bell is shown to have been 1624, which shows how long it has been in service. At that time little or no attempt was made by workers in metals to extract gold and silver from copper ores. The precious metals were procured from the mines which carried lead as well, and as a consequence was much easier smelted. Copper ores were reduced in a crude way, and the gold and silver, if they were recognized, were allowed to remain. On account of the high values of silver and gold which the old bell has been found to carry it is believed that considerable amounts of the precious metals were placed in the melting pot by church devotees, who at that time believed that a pious thing to do. Silver was known to improve the tone of bells, and the gold may have been added as a kind of sacrifice, old records showing that in some cases the priests of that day induced the richer classes to give up their golden ornaments for that purpose.

The finding out of the worth of this bell is likely to have a far-reaching effect in the other churches here, as it is believed that all of the copper bells in this city are just as valuable as the one which has just been sold. The congregations of the other churches are ready to take the matter up.

There are no musical chiming bells in the old Mexican churches. Upon *fiesta* days the many great bells hanging in the tower niches are operated in the most primitive fashion. The men and boys who do the ringing ascend to the belfries and strike the clappers against the metal by hand. A dreadful uproar is thus produced. Sometimes when a cracked veteran noisemaker is struck the sound which it emits resembles that produced by the forcible contact of a fire poker with a battered saucepan, and impels one with a musical ear to paraphrase as a prayer the words of Othello: "Silence that dreadful bell; it frights the town from its propriety."

J. J. D.

Tennessee Company Finances.

The directors of the Tennessee Coal, Iron & Railroad Company have decided to issue the remainder of the $7,300,000 of new stock authorized by the stockholders some months ago and which brought the capitalization of the company up to $30,000,000. The $3,500,000 issued in the spring of this year, the third payment on which is made this month, is already taken up by the improvements laid out for the plants in the Birmingham District. Further extensive betterments are contemplated for the rounding out of all departments, and from the $3,800,000 of additional stock about to be issued an important appropriation will be made for the Birmingham Southern Railroad, the terminal line which the company reacquired in June from the Louisville & Nashville and the Southern railroads. It has 100 miles of track. New equipment will be ordered and a large amount of work done in rehabilitation and improvement. The final payment of $875,000 on the first issue of the new stock is due in January. The four payments on the issue of $3,800,000 will begin before that time and will follow along at intervals of three months. At the meeting at Tracy City, Tenn., October 16, the increase of the capital stock from $30,000,000 to $50,000,000 was authorized, the greater part of the stock of the company being voted by proxy. While it is stated that the intention is ultimately to bring about a union of the Tennessee and Republic Iron & Steel companies, the increase in question is not with an immediate view to such a consummation, but rather to give the directors a general authorization for any additional stock issues that may seem called for at any time, without the delay and formalities and the definite declaration of the purpose for the increase that have been necessary heretofore.

The New England Foundrymen's Association.—The monthly meeting of this society was held at the Exchange Club, Boston, Wednesday evening, October 10, with President Walter B. Snow in the chair. Dinner was served at 6 o'clock, after which routine business was transacted. The death of Edgar B. Pierce of the Wheeler Foundry Company, Worcester, was reported, and a committee to prepare resolutions was appointed, consisting of Charles E. Hildreth, John F. Kyes and L. A. Colvin, all of Worcester. E. Stütz of the Goldschmidt Thermit Company, New York, made an address on "Thermit Heating and Welding Compound," which was illustrated by stereopticon views. It was announced that the next meeting would be held in Boston, as usual, instead of at New Haven, as previously arranged, and that the speaker would be Dr. Richard Moldenke, Watchung, N. J.

The American Pig Iron Storage Warrant Company had 8300 tons of pig iron on hand September 30, 1906, having received 1500 tons and delivered 1400 tons in September.

Canada to Smelt Moose Mountain Ore.

TORONTO, October 13, 1906.—A proposition has been made to the council of this city for the utilization of 50 acres of Ashbridge's marsh as the site for a blast furnace and steel works. The offer comes from MacKenzie & Mann and other parties associated with them. The marsh in question is a tract that up to the present has remained a waste, lying on the lake front of the eastern part of the city. Of late the demand for manufacturing sites has turned attention to it, and last spring the ratepayers authorized the council to spend a large sum for the reclamation of the marsh, part of which is separated by an inlet. The whole extent of the swamp is to be filled in. MacKenzie & Mann, it is scarcely necessary to say, are the masters of the Canadian Northern Railway Company, whose great system is unfolding in all directions throughout the West, and is rapidly extending into a transcontinental highway. One of the company's lines now under construction is the James Bay Railway. Starting at this city, it is to run to James Bay, the southern arm of Hudson Bay. Already the road is built from Toronto to Parry Sound on Georgian Bay, and it is expected to be extended through Sudbury into Hutton township, 26 miles north of that town, before the end of next year. At some point in the latter locality it will intersect the trunk of the company's transcontinental line, which is to be pushed eastward along the north shore of the Upper Lakes from its present terminus at Port Arthur. From Hutton township, where the Moose Mountain iron property is owned by MacKenzie & Mann interests, ore will be hauled on the new railroad to the furnace at Toronto. Exactly as MacKenzie & Mann interests are making Port Arthur an iron and steel center by their construction of furnace and allied plants there for operating on ore in Atikokan mines belonging to them, so they propose to give a start to the iron and steel industry in Toronto by establishing there works for the consumption of their Moose Mountain ores, the MacKenzie & Mann railroad being the carrier of the raw material in both cases.

The furnace, as now projected, would be one of at least 200 tons daily capacity. This would be in operation two years hence. Steel rolling mills are also contemplated, according to statements made in the company's behalf. The ore haul would be slightly less than 300 miles. Toronto is favored rather than an interior point because, being on Lake Ontario, it would be convenient for the laying down of coke from the United States.

The Moose Mountain Deposits.

This iron range has been studied by Professors Coleman and Miller of the Ontario Bureau of Mines, and was examined in 1902 by C. K. Leith, of the United States Geological Survey. This description is given in the Ontario Bureau of Mines' report of 1903. He describes these magnetite ores as minutely interbanded with silicious material. They vary from lean to high grade. Ordinarily, the lean and high grade ores are in separate exposures. The silicious impurities tend to lower the grade of the ore very rapidly. As to the amphibolitic and epidotic impurities, he says they may be present in considerable abundance and the ore be of good grade, although such impurities may slightly increase the difficulty of working the furnace.

Mr. Leith notes points of resemblance between the Moose Mountain range and the Vermilion range in Minnesota, but concludes nothing from them. His own words are as follows:

> In their steeply inclined altitudes their relations to surrounding greenstones and green schists, their sharp and irregular contact with these rocks, their intrusion by acid igneous rocks, the iron foundation belts of the Moose Mountain range show very suggestive similarity to the iron and jasper belts and associated greenstones and green schists of the Vermilion iron district of Minnesota. They differ in the character of the ores, those in the Moose Mountain range being magnetite, while those in the Vermilion range are hematite; in their association with fragmental pyritiferous graywacké, the Vermilion ores having associated slate, but apparently no coarsely clastic material; in the presence of amphibole and epidote in a part of the ores, those being lacking in the Vermilion ores; in that a considerable part of the greenstones in the Moose Mountain range are intrusive, while in the Vermilion range they are practically all basalt; and in that the Moose Mountain ores lack the associated brilliantly colored jaspers which are a very characteristic feature of the Vermilion range. These differences are such that in the absence of any structural connection with the Vermilion Districts any correlation of the Moose Mountain and Vermilion iron bearing series would be a mere guess.

Referring to the character of the ore, Mr. Leith says much of it is too lean for present use, but that there is a considerable amount running above 58 and 60 per cent. in metallic iron. As to the possible extent of the deposit, he says the indications are promising. Sulphur is in very small quantities, varying from 0.01 to 0.08 in the numerous specimens analyzed. Titanium is altogether lacking. The ore is hard and crystalline, and because of its crystalline character it will crush to a good size for furnace use. Mr. Leith adds: "It will doubtless be found to serve admirably for mixing with soft ores, such as Mesaba." He assumes that the ore will be used in the United States, but the conditions now appear favorable for its use in Toronto.

As to the suitability of this or any other Ontario magnetite ore for steel making, some encouraging results have been obtained by J. Walter Wells, of the Ontario Bureau of Mines. He has made tests with magnetite ores from various parts of the Province, and has found that even comparatively refractory ores of this can be brought to Bessemer grade by magnetic concentration.

C. A. C. J.

The American Society of Mechanical Engineers' Coming Meeting

The annual meeting of the American Society of Mechanical Engineers, which is always held in New York, is scheduled this year for December 4 to 7, beginning Tuesday and continuing through Friday. The various sessions will be held at the Engineering Building. Concurrently similar meetings will probably be held by the other Founder societies, the whole constituting an informal opening of the Engineering Building, though the official opening and transfer from the Building Committee to the societies will not occur until some time later. As this announcement indicates, the building is very nearly completed, the only remaining work being the trim on several floors and the painting and decorating. It is expected that all the workmen, except perhaps the decorators, will have vacated the building when the convention opens. The chance to inspect the new Engineering Building will be one of the special attractions of the coming meeting, and there is also every prospect that a number of unusually interesting papers will be presented.

A New Lackawanna Blast Furnace.—The Lackawanna Steel Company has begun work on the erection of a seventh blast furnace at its plant at South Buffalo, N. Y. It will be of 500 tons daily capacity, following in general the lines of blast furnace No. 6, which was lined up to somewhat smaller diameter than 3, 4 and 5 of the modern size group, all of which are 94 ft. high. The new furnace will be located to the north of Furnace No. 1, in that portion of the company's lands in which the rock is nearest the surface, and the difficulties in foundation work met with in other portions of the site will be avoided. A record for rapid construction work is aimed at and it is hoped to have the new furnace in blast in the spring of 1907. Blowing equipment is all at hand. At its by-product coke plant the Lackawanna Steel Company is now getting an increasing output, seven batteries of 47 ovens each being active, and this number will soon be increased to 10 batteries. The directors of the company have been making an inspection of the plant this week in connection with their annual meeting.

In Germany the Siegerland Iron Ore Syndicate has raised the price of raw iron ore 1.6 marks per ton and of roasted ore 2.5 marks per ton. The Siegerland Pig Iron Syndicate is expected to follow with advances, particularly as demand for pig iron increases.

Massive Rolling Mill Engines.

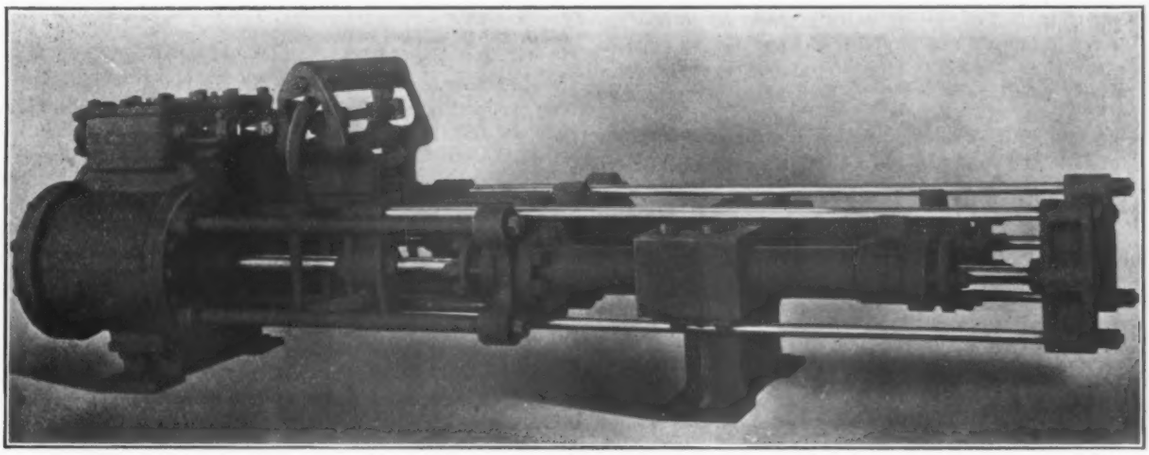
Six of the most massive engines ever designed for rolling mill service are now under construction at the West Allis works of the Allis-Chalmers Company, Milwaukee, Wis. They are being built for the Carnegie Steel Company, Pittsburgh, and will be installed in its Homestead, Edgar Thomson and South Sharon plants, respectively. Four of these engines are horizontal, compound, noncondensing and are fitted with Corliss valve gears. The high pressure cylinders are 50 in. in diameter, and the low pressures 78 in., with a stroke of 60 in. While these engines are designed on the lines of the company's tandem type, they differ in a number of important details owing to their massive construction. The engine body plates, which are 11 ft. wide, 10 ft. high and 31 ft. long, and weigh approximately 104 tons each, are cast in one piece, with slides, which are bored where the crosshead travels. The valve gear is the well-known Reynolds-Corliss type and is driven by two eccentrics, one for the steam valves and one for the exhaust valves. The valve gear is arranged for long range cut off, and, in keeping with the rest of the engine, is made exceptionally massive and strong. The low pressure cylinder is placed next to the engine frame, while the high pressure cylinder is tandem behind the low pressure and is connected with it by very heavy tie pieces which are made of steel castings. Sufficient distance is allowed between the cylinders for an intermediate slide to support the piston rod, the weight of the low pressure piston being carried by this rod. A very heavy sole plate extends from the back end of the engine from under both cylinders and the intermediate slides. A receiver of ample size is placed alongside of the foundation below the floor line and is connected to the high and low pressure cylinders.

Two of these engines, one right hand and one left hand, will go to the Edgar Thomson Works, and two, one right hand and one left hand, to the Homestead Works of the Carnegie Steel Company. The only difference in the engines, aside from the change in the hand, is in the flywheels, which are varied somewhat in diameter and weight to suit the varying requirements as to speed and character of service. One of the Edgar Thomson engines has a wheel 25 ft. in diameter, weighing 224,000 lb. The flywheel of the other is 20 ft. in diameter, weighing 160,000 lb. The Homestead engines have 22-ft. flywheels, weighing 180,000 lb. each. The engines will run at about 75 rev. per min. and are intended to work noncondensing under a steam pressure of 150,000 lb. per square inch. Under these conditions each will develop at the most economical load approximately 5000 i.h.p., and at maximum load approximately 9000 i.h.p.

The other two engines will be installed in the South Sharon (Pa.) Works of the Carnegie Steel Company, and are built as a pair of tandem compound reversing units. The high pressure cylinders are 42 in. in diameter and the low pressure 70 in., with a stroke of 54 in. The frames and slides of this pair of engines are from the same pattern as the other four. The cylinders, however, have piston valves driven by Marshall valve gear and the reversing gear is operated by steam, while the steam reversing cylinder has a cataract oil cylinder connected with it. One engine of the pair has a double throw crank, and the power is all taken off at one end of the shaft. The same designs in the matter of construction are followed in these machines as in the others, the differences being limited to those necessary to accommodate the change in the size of cylinders and the type of valve gear employed.

A Notable Canton Hydraulic Pressure Pump.

A high pressure steam pump of more than passing interest is the one shown in the accompanying illustration. It was recently built for the Allegheny Steel Company of Allegheny and Brackenridge, Pa., by the Canton Pump Company, Canton, Ohio, and is used for stretching iron. The steam cylinders are 10 in. in diameter, the water plungers 1½ in. and the stroke is 10 in. The pump gives a pressure ranging from 2000 to 5000 lb. per square inch, when supplied with steam at 120 lb. The water cylinders are hammered steel forgings and are capable of withstanding 5000 lb. to the square inch. The valves are of bronze and are of free opening type. Hydraulic packing is used in the pump, and cold rolled steel rods for the stretcher and connecting rods. The plungers are steel. The pump occupies a floor space of about 34 x 82 in. and weighs 3000 lb.



A Pump Capable of Exerting a Pressure of 5000 Lb. to the Sq. In. Built by the Canton Pump Company, Canton, Ohio, for the Allegheny Steel Company.

Several innovations have been made in the machinery department and general fittings of the British battleship Hibernia. The most important of these is the application of forced lubrication in the engine room. Weir's pumps have been fitted to the central bulkhead to force the lubricating oil by means of pipes to all parts of the bearings and cranks. For this purpose the crank pins have been perforated and grooves cut in the bearings. They are also all covered over to exclude all foreign matter. Another departure is in the method of heating the various compartments of the ship and the cabins by the substitution of hot air pipes for the steam pipes. The reservoirs are so designed that the hot air service may be disconnected from each such apartment at will. Another novelty consists in the application of motors for working the pumps. This practically completes the placing of all work which was formerly performed by manual labor under the domain of machinery and the engineer.

The Congress of Workmen's Unions, at Amiens, France, decided October 11 to continue the agitation in favor of an eight-hour day in France and to prepare for a general strike, to be called at the discretion of the Central Committee.

Producer Gas for Power and Fuel.

BY JULIUS L. WILE.

Producer gas can best be defined as the gas produced by passing a mixture of steam and air through an incandescent fuel bed. For gas engine service or for transmission through pipes to burners the gas is cooled and cleaned in suitable apparatus, while for furnace use the gas is often taken hot directly from the producer. In steam boilers complete combustion is desired, hence it is sought to convert the carbon of the fuel into CO_2 (carbon dioxide) and a thin fuel bed is used. Producer gas calls for incomplete combustion, or the conversion of the carbon into CO (carbon monoxide), and a deep fuel bed is used.

Producer gas offers greater economy by its use in internal combustion engines than is to be obtained with steam boilers and engines. In the latter the economy depends upon the types and sizes of boilers and engines; also to a large extent on the auxiliary apparatus, such as condensers, superheaters and economizers. Even with these auxiliaries the best thermal efficiency ever obtained in steam practice is not much greater than 15 per cent. of the original value of the coal converted into work, while efficiencies of 3 to 6 per cent. are more common, especially in noncondensing units of from 50 to 500 hp. With gas producers and producer gas engines an efficiency of over 22 per cent. is now common even in comparatively small units, while as high as 24 per cent. has been obtained. An average table of efficiencies of steam engines and boilers for the different types of engines is as follows: the coal used being assumed to have a heat value of 13,000 B.t.u. per pound:

Type.	Pounds of coal per b.h p.	Thermal efficiency. Per cent.
Simple noncondensing, throttling	6	3.26
Simple noncondensing automatic	4⅓	4.35
Simple noncondensing, Corliss	3½	5.6
Compound noncondensing, Corliss	3	6.55
Compound condensing, Corliss	2¼	8.75
Steam turbine condensing, Corliss	1¾	11.25
Triple condensing, Corliss	1⅓	14.75

The efficiencies of gas engines and suction gas producers from actual tests for engines of different size are as follows:

B.h.p.	Type.	Fuel.	B.t.u. per pound.	Fuel in pounds per b.h.p.	Thermal efficiency. Per cent.
20	Single cylinder	Anthracite	15,138	0.797	21.25
90	Single cylinder	Coke	12,411	0.91	22.5
250	Double acting	Anthracite	14,600	0.744	23⅓
300	Two-cylinder	Anthracite	11,370	0.975	24

As a fuel in large furnaces producer gas is widely used in steel and glass works for melting and other industrial purposes where the gas is taken from the generator hot into the furnaces. These applications have found favor chiefly on account of the ability to transport the gas long distances, while centralizing the coal and ash supply and also the economy to be obtained by burning gas with the correct ratio of air; while if coal were used, in order to effect complete combustion an excess of air and consequently a waste of heat is required. Rapidity of output has also been obtained, due to the control of the heat. In steel works practice the introduction of producer gas for fuel has roughly increased the capacity 33 1-3 per cent. with an added economy of fuel of 25 per cent. The gas used in steel works is made from bituminous coal, uncleaned, and therefore contains volatile matter and tar. This gas is transported through large brick flues where the tar can be deposited and the flues are cleaned weekly.

Gas producers for engine service and for transmission through pipes and burners always include cleaning apparatus; otherwise the tar and impurities would clog the valves, pipes or burners. From such producers clean gas is obtained, suitable for distribution over long distances. They furnish a cheap supply of artificial gas to take the place of illuminating gas, which is costly, or where natural gas has given out. The total fuel cost of producer gas, with coal at $3.00 per ton, is 2 cents per 1000 cu. ft. Compared to illuminating gas of 575 B.t.u. per cu. ft., about five times the amount of producer gas is necessary to do the same work; while seven times the amount is necessary to do the same work as natural gas; therefore to be the equivalent of 1000 cu. ft. of illuminating gas, the fuel cost of producer gas would be 10 cents, while for natural gas it would be 14 cents. Should the price of coal be higher or lower than $3, the fuel cost will be in the same proportion. For instance in Pittsburgh, with coal at $1.50 per ton, the cost of producer gas to do the same amount of work as 1000 cu. ft. of natural gas would be but 7 cents.

Producer gas for fuel requires pipes at least twice the diameter of those used for illuminating gas. Burners are required with number and size of openings which will burn the gas at the best efficiency and obtain the heats required. The gas burns with a blue flame, hence the necessity of the air blast commonly used with illuminating gas is eliminated. For temperatures as high as 2,000 degrees F., provided proper burners are installed, it is not necessary to preheat the air, while if higher temperatures are wanted it is necessary to install recuperative or regenerative furnaces as in glass or steel works. Experiments are now being made with a view to supplying producer gas furnaces for the higher temperatures where the recuperative or regenerative furnaces are done away with, and where all parts of the furnaces are above the floor. Increased output over the older types is also expected.

The selection of a producer gas engine should be confined to those firms which have designed engines especially for producer gas. The differences between producer gas engines and illuminating or natural gas engines are mainly in the sizes of valves and ports, increase of compression, method of mixing the air and gas, and special ignition. Compressions as high as 150 lbs., as compared to 90 lbs. used on natural gas, are employed. The air and gas do not mix until they reach the valve, and the valves should be so designed that a layer of air will come between the exhaust gases passing out and the incoming mixture.

Producer gas is composed of carbon monoxide, hydrogen, carbonic acid, nitrogen and also a small amount of marsh gas. An analysis by volume is as follows:

CO	0.25
H	0.12
CH_4	0.01
CO_2	0.5
N	0.57

The heat value being 140 B.t.u. per cu. ft. of gas. The amount of combustible due to the amount of CO, H and CH_4 in the above is 38 per cent.

In the formation of the gas, air is admitted in the bottom of the fuel generator, where it combines with the carbon of the fuel and burns to CO_2, which reaction in itself generates heat. The CO_2 gases pass through the incandescent carbon, where on account of absence of oxygen, they are converted into CO by taking up the carbon of the fuel, as follows: $CO_2 + C = 2CO$.

The manufacture of the gas always involves the use of steam, which serves two purposes; it helps to keep clinker from forming, due to the reduction of the temperature of the fuel bed, and furnishes oxygen undiluted by nitrogen. Steam when decomposed by the incandescent fuel separates into its component parts, thereby enriching the gas by the liberation of the hydrogen, and furnishes oxygen. The reaction is as follows:

$$H_2O + C = CO + H_2$$
$$\text{and } 2H_2O + C = CO_2 + 2H_2$$

Both of these reactions take place in the producer, the first being effected by high temperatures, while the second is effected by lower temperatures of the fuel bed.

Producer gas is made in three types of producers: suction, pressure, and a combination of both suction and pressure producers. In the first the gas is made by the draft due to the suction of the piston of a gas engine and is always under atmospheric pressure. The extent of the draft and the amount of gas supplied is automatically controlled by the load on the gas engine and no storage reservoir is required. A suction producer comprises the gas generator, steam vaporizer, wet scrubber and dry purifier. These producers have many ad-

vantages, but are limited to power applications only because the suction is provided by the engine. They have a high efficiency, as much as 85 per cent. of the fuel being converted into cool and clean gas. For distributing gas, or where several engines are located at considerable distance from the producer, or when gas is wanted for fuel purposes, or for power and fuel purposes, it is necessary to put the gas under pressure.

In pressure producers the gas is under pressure greater than atmospheric. This is created by external means, such as steam pressure or a fan blower. The gas is stored in a large gas holder. Pressure producers, where the pressure is supplied before the gas leaves the generator, have been in use over 25 years. This type, however, is subject to many changes in the quality of the gas, and consequently large gas holders are required. To obtain a uniform quality of gas, and thereby allow a small gas holder to be used, the later types of pressure producers are of combination suction and pressure types; that is, a fan draws from a producer of suction type and puts the gas under pressure. By controlling the draft the amount of gas made is controlled and a fixed proportion of air and steam is drawn through the gas generator independent of the resistance of the producer, thereby overcoming the main objection to the straight pressure producer, where the proportion of air and steam varies with the resistance of the producer.

This combination suction and pressure producer comes under the head of pressure producers, as the gas is under pressure, but it makes a uniform quality of gas, and enables a small gas holder or regulator to be used. These regulators can be very small provided the gas is automatically controlled, otherwise the holder must be larger to provide storage capacity.

In this type of producer the draft is caused by external means, which is always placed between the producer and holder. The steam, as in a suction producer, is raised by the gases on their way to the cooling apparatus, so that outside steam is not required. Efficiencies of over 80 per cent. are obtained, compared with 50 to 65 per cent. of older types.

A pressure producer of the combination type comprises the gas generator, steam vaporizer, wet scrubber, dry purifier, fan or steam exhauster, gas holder and a draft regulator.

Producer gas is made from various kinds of fuel, such as anthracite, charcoal, coke and from bituminous coal, lignite, wood, peat and other fuels containing carbon. These fuels are classified as-"nonbituminous" and "bituminous" and the class of fuel used determines the type of gas generator to be employed. Nonbituminous fuels, such as anthracite, charcoal and coke, have little volatile matter and are easily adaptable for making producer gas.

Bituminous fuels, such as soft coal, lignite, wood, peat, &c., have larger quantities of volatile matter and contain tar, which must be removed.

There are two distinct methods of removing it from the producer. The older method is to wash out the tar by adequate scrubbing and cleaning apparatus. The modern method is to convert this tar into permanent gas in the producer generator and use only standard purifying apparatus such as would be used with nonbituminous fuel. It is a distinct improvement, as the tar in the fuel often comprises in ordinary soft coal up to 10 per cent., while in lignite and other fuels even more than 25 per cent. of the heating value of the coal. In addition to the loss due to removing this tar there is a further loss in the older method due to the large amount of water and power necessary to get successful results from the operation of the cleaning apparatus.

A producer of the former method has an efficiency of from 50 to 65 per cent. in terms of heat of the fuel converted into cool and clean gas. It takes into account the amount of coal used to raise steam and the amount of power required to drive the blower as well as the amount of power required to drive the scrubbing apparatus. In the combination producers, in which the tar is removed in the producer itself, an efficiency of over 80 per cent. has been obtained, which takes into account the amount of power required to drive the fan exhauster.

In Europe the use of the suction producer, both for bituminous and nonbituminous fuels, especially lignite briquettes, has been very extensive, but in this country the success of the suction producer has until recently been limited to the use of nonbituminous fuel such as anthracite, coke or charcoal. In using bituminous coal there is an erroneous impression that it is necessary to use a pressure producer. Probably the prejudice in favor of pressure producers for bituminous coal has arisen from the fact that the larger American gas engines have been built usually for natural gas, and to get the large volume of producer gas necessary into such engines, pressure has been of advantage. If the gas engine were designed especially for suction gas it would not be necessary to have the gas under pressure. Bituminous fuel producers, however, are not practicable in units less than 100 hp., because the tendency of the fuel to cake makes it necessary to have a suitable bed of fuel to deal with. As to the extent of the cleaning apparatus, if the proper producer is employed it is not necessary to use any greater amount of water nor any larger dimensions than would be required with an anthracite plant.

Producer gas engines are now usually made in single cylinder form up to 150 hp. in both vertical and horizontal types. These types are no doubt the simplest and best for work where close regulation is not of the utmost importance, such as flour mills, pumping stations, &c. If close regulation is desired, such as for electric light work, cotton mills, &c., a two-cylinder engine is to be preferred. Double acting units are used in sizes of 150 hp. and larger in both single and tandem engines, and for units of 500 hp. and larger, the tandem double-acting and twin double-acting four-cylinder types seem to be favored. The two-cycle type of engine, as applied to producer gas, has not as yet been extensively adopted.

In *The Iron Age*, September 6, 1906, there was described an installation of three producers, taking the place of illuminating gas. The fuel cost of the gas replacing 1000 cu. ft. of illuminating gas is 15 cents, using coal as high as $4 per ton, while the interest, depreciation and attention add on another 15 cents, making the total cost of the gas 30 cents, compared to $1 previously paid. The gas is used for heating wax kettles, japanning, soldering, boiling water in the chemical laboratory, American gas furnaces and open flame work. A notable feature in conjunction with the use of this gas is that no air blast is required, which was previously used with illuminating gas to obtain the heats required. This installation, at the works of the American Graphophone Company, Bridgeport, Conn., is probably the first replacing illuminating gas for the purposes as above outlined.

The leading steam engine builders of the United States are now building gas engines especially designed for producer or weak gases, and the most successful builders up to the present are those who have followed the European practice. It is the author's opinion, however, that American firms will overtake and distance European firms both in extent and improvements in gas producers, gas engines and producer gas applications.

In connection with the organization of the steel tube combination in Great Britain it is stated that of the 300,000 tons manufactured yearly by the firms in the agreement 70 per cent. goes abroad. In the period of severe competition which preceded the formation of the combine, steel tubes touched the lowest point on record in the British market, while raw material steadily advanced. The result was heavy losses to a number of manufacturers. Of 60 firms in the United Kingdom engaged in manufacturing and selling tubes all entered into the agreement with the exception of one Glasgow house. Boiler tubes were excepted from the arrangement because the Glasgow firm makes a specialty of these.

The total engagements of gold for importation since September 10 aggregated $50,600,000 up to the close of last week. This is in excess of any previous engagements during a six weeks' period in our history. The $45,011,000 imported during August and the first half of September, 1893, has hitherto held the record.

The Victor Nut Facing Machine and Collapsible Tap.

A machine entirely new among those intended for its class of work is the Victor nut facing machine, illustrated in Fig. 1 herewith and sold exclusively by the G. M. Yost Company, Waynesboro, Pa. The machine is exceedingly simple in every respect, as may be appreciated from the fact that it has not a single gear or pinion in its entire construction. It is made in two sizes, No. 1, for facing nuts from ¼ to 2 in., and No. 2, for facing nuts from ¼ to 3 in. The machine is semi-automatic, taking on and relieving nuts automatically without reversing the machine. In a test of its speed it was found capable of facing 20 ⅝-in. nuts in a minute. When it is desired the machine is also equipped with a bolt shaving attachment. The machine is operated by a single lever and, as previously stated, there is no reversing. The only wearing parts are the cutters, and they are easily kept in order.

Fig. 2 shows a view of the Victor collapsible tap, which is made in one solid piece, hence is very simple and strong. It is made either with or without a reamer attachment and in sizes from 1¼ to 12 in. The shanks are made straight or any taper desired. The tap can be used on either turret lathes or drills, and is opened and closed automatically by the use of a cam on the machine. The principal advantages of the collapsible tap are the saving of time by virtue of the collapsing, which does away with backing out the tool, and incidentally saves the wear on the tool, since the backing out with an ordinary tap has a tendency to destroy the cutting edges. It is also claimed to do better and truer work, as the tap remains in better condition and retains its size. The only parts to wear are the chasers, and they can be renewed at a nominal cost.

The Victor nut facing machine and the Victor collapsible tap are both made by the Hendricks Mfg. Company, Waynesboro, Pa., for which the G. M. Yost Company of the same city is sole agent.

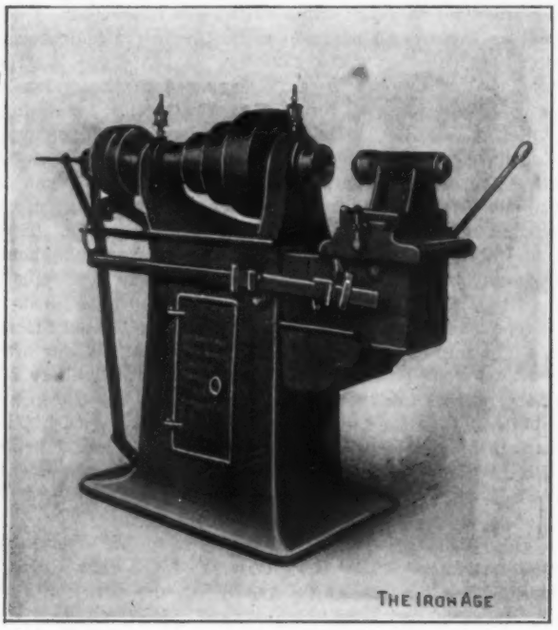


Fig. 1.—The Victor Nut Facing Machine.

A very high operating economy from alcohol is indicated by the comparative tests of alcohol and gasoline recently made in internal combustion engines, though it has only about 70 per cent. of the thermal value of gasoline. The superior economy with alcohol has been put as high as 20 per cent., which in part is due to the higher preignition compression. Since the internal revenue tax on denatured alcohol will be removed next year this showing is of considerable importance, as it is believed that alcohol will be sold for about the present price of gasoline. It is generally considered that with some slight modifications in the carbureter or vaporizing devices alcohol may be used in standard gasoline engines..

The Reclaiming of the Zuyder Zee.

A land-reclaiming undertaking of unusual magnitude and exceptional interest is the projected laying dry of the vast area of the Zuyder Zee, Holland, which has been under discussion for many years. During this time the plans have been considerably altered and modified, but a government proposal has now been drawn up and passed by the legislature. The present Zuyder Zee is the outcome of a number of floods, the area which it now comprises having originally been firm land, with only a moderate sized lake; but the North Sea by degrees swamped the whole district, its ravages, of which accounts are recorded as far back as 100 years before Christ, culminating in the floods of 1170, 1277, 1287, 1337, and 1362.

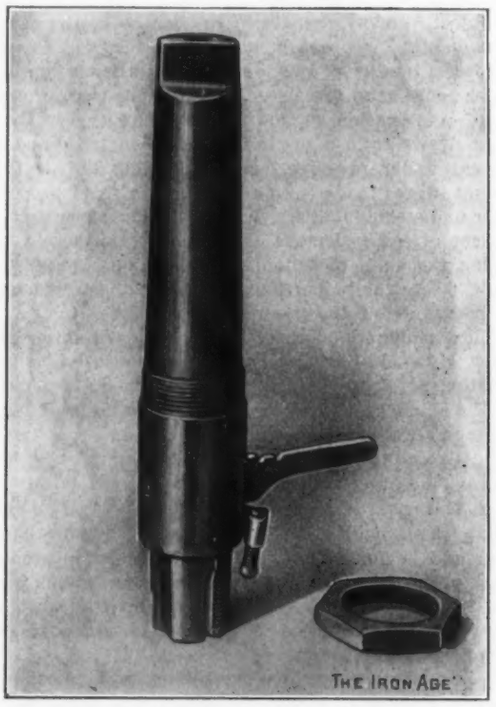


Fig. 2.—The Victor Collapsible Tap.

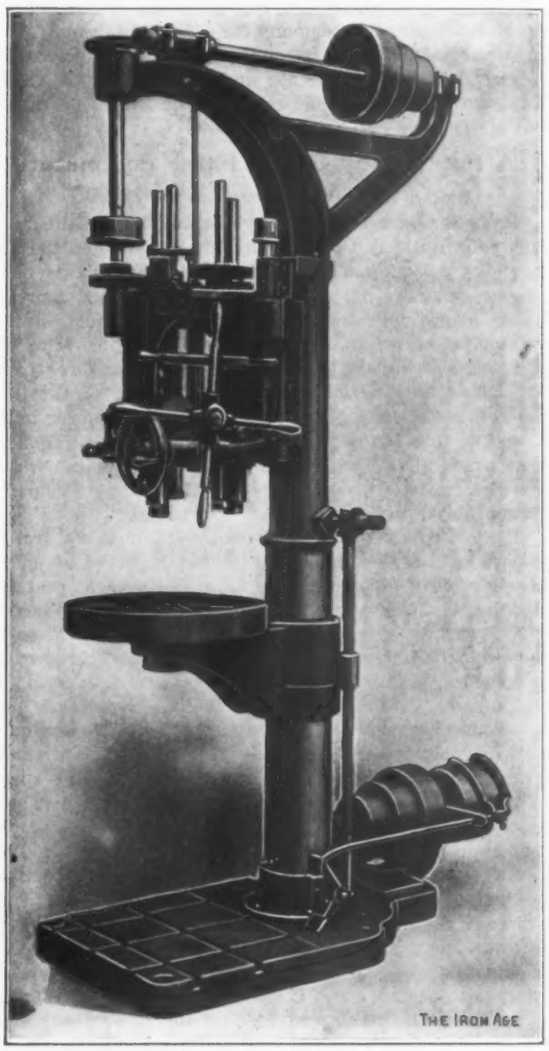
It has long been the ambition of the Dutch to restore their country to what may be considered its original size, and in some 30 years they hope to have compassed it. The area of Holland at present is about 33,000 sq. km., and that of the Zuyder Zee 5250 sq. km. The depth varies from about 11 ft. to about 20 ft. at the deepest. It is proposed to leave a lake of some 1200 sq. km., but the rest, excepting of course the necessary canals, will, according to the present plan, be transformed into marsh land. The first and most vital part of the work is the construction of a dam nearly 20 miles long, proceeding from Ewgk, in North Holland, by way of the island of Wieringen, to Piaam, in Friesland. This dam, which it is calculated will take some eight years to complete, will turn the Zuyder Zee into a lake. The breadth of this dam 18 ft. above the level of the sea will be 30 ft., and on its inner slope it is proposed to construct a double-track railroad and a roadway 20 ft. broad. It goes without saying that this will be a very difficult dam to build, considering the always present risk of floods and the power of the breakers.

Simultaneously with the work on the dam, the canalization of the area inside it will be taken in hand. The laying dry of the area to be reclaimed will be done piece by piece, it not being considered advisable to go ahead with a second piece until the first has been covered with vegetation. The Dutch have immense experience in this kind of work, and have always acquitted themselves exceedingly well. The cost of the whole undertaking is calculated at about $60,000,000.

The Baker Cylinder Turret Drill.

For drilling, tapping and reaming duplicate parts without replacing the tools or resetting the work between succeeding operations the National Separator & Machine Company, Concord, N. H., is now building an upright drill of special design, known as the Baker cylinder turret drill press. The machine shown in the engraving is provided with four spindles, but four or six spindles can be furnished, as desired, and with either power, hand or lever feed, or all of them. It is driven from a line shaft in the usual way, and should be belted for a speed to suit the class of work to be done, ordinarily from 300 to 400 rev. per min.

The turret carrying the spindles revolves in an outer



The Baker Cylinder Turret Drill Built by the National Separator & Machine Company, Concord, N. H.

casing and is arranged so that when the desired spindle is turned to the front the driving gear meshes with a gear on that spindle and causes it to revolve, while the other spindles are left back out of the way until they are to be used, when the turret is revolved to each spindle in turn. The same sized gear is placed on all of the spindles but one, and this is geared to run at a slower speed for tapping and counterboring. The spindles can be fed to the work directly by the windlass wheel or by the hand wheel in front, or by power, and stops can be set to trip the power feed automatically. All of the spindles work to the same point on the platen, —namely, the center. The turret locking device is close to the active spindle, and the moment power is applied the strain is communicated to the frame of the machine, the turret simply acting as a guide. If the work requires, the different spindles can be set to run at different speeds. Only the spindle in use revolves, the others remaining inactive and out of the way; consequently there is no power wasted in running idle spindles. The feeding is also independent—that is, only the working spindle feeds down. The turret turns either way and locks automatically and the feeds can be changed instantly.

The setting of the machine for a piece of work may be accomplished without any great loss of time, for after the operator has the first tool running he may put the other tools in place, since it is only the working spindle that revolves. The turret is hung on ball bearings and revolves easily. The feeds are changed by the lever at the front projecting toward the operator and within his easy reach.

The machine is particularly a desirable one for using high speed drills, taps, reamers, &c., because the correct speeds and feeds for different sizes may be easily obtained. The machine is 7½ ft. high. The diameter of the platen is 20 in. The distance between the base and the spindle is 48 in. and the distance between the platen and the spindle 32 in. The spindles are fitted for 3-in. Morse tapers. Each spindle has a travel of 10½ in. and will drill a hole anywhere in a 26-in. circle. There is sufficient power in each spindle to drive a 1⅜-in. drill in solid cast iron. The machine illustrated, known as size No. 1, to which the foregoing dimensions apply, occupies a floor space of 48 x 24 in. and weighs in the neighborhood of 1200 lb.

Crocker-Wheeler Equipment for the Bethlehem Mill.—The Bethlehem Steel Company, South Bethlehem, Pa., has placed an order with the Crocker-Wheeler Company, Ampere, N. J., for the complete electrical equipment of a new rolling mill, amounting to about 6000 hp. in motors. The mill includes rail making machinery, cooling beds, equipped for pull-on and rake-off attachments, the necessary machine tools, &c. The greater part of the motor equipment will consist of Crocker-Wheeler Form W rolling mill motors, the first and only line of motors ever built specifically for excessively heavy rolling mill service. All sizes of this machine will be represented—25 hp., 50 hp., 75 hp. and 100 hp. There will be also a number of the special open three-bearing generator type of Crocker-Wheeler motors, giving outputs of 115 hp. and 225 hp., and the Form I machine tool motor in various sizes, as well as several of the Crocker-Wheeler crane motors. The placing of this order is a further recognition of the Crocker-Wheeler rolling mill motor and of the ability of the company to handle complete modern rolling mill equipments.

The International Aero Vehicle Company, Dayton, Ohio, has been organized to manufacture airships. Plans for a factory have not yet materialized and the machines for a few months to come will be built without the aid of a permanent factory by being assembled at a central point, contract for the material and machinery being sublet. At the present time the G. H. Curtis Company, Hammondsport, N. Y., is building the motors. W. G. Critchlow is interested in the company.

The name of H. L. Tripple, representing the Fairbanks Company, should have appeared in the list of those constituting the General Committee of Arrangements of the Philadelphia Foundrymen's Association for the annual convention of the American Foundrymen's Association and its allied organizations to be held in Philadelphia May 20 to 25.

A notable shipment of Star regrinding valves was recently made by the manufacturer, the Wm. Powell Company, Cincinnati, Ohio. It was a carload consisting of 81 barrels and 27 boxes, containing in all 6196 valves, having a total net weight of 32,995 lb. The order is destined for Cavite, in the Philippine Islands, and will be reshipped through the storekeeper of the New York Navy Yard.

Conditions of Fan Blower Design.

The velocity with which air escapes into the atmosphere from a reservoir depends upon the pressure and density of the air. The pressure per unit of area divided by the density per unit of volume gives the head, usually designated as the "head due to the velocity." The velocity produced is that which would result if a body should fall freely through a distance equal to its head. In the case of the flow of water such a head always exists; as, for instance, when a stand pipe is employed to produce the requisite pressure. Suppose the head of water to be 50 ft. and its weight per cubic foot to be 62.5 lb., then the pressure per square foot will be 50 x 62.5 = 3125, and that per square inch 3125 ÷ 144 = 21.7 lb. Its theoretical velocity of flow from an orifice at the bottom of the stand pipe would be 56.7 ft. per sec., as determined by the formula for falling bodies, $V = \sqrt{2gh}$, in which v = velocity in feet per second, g = acceleration due to gravity, and h = head in feet, here 50 ft.

In the case of air, however, an actual homogeneous head never exists, but in its stead an ideal head which can only be determined by dividing the pressure by the density. As the density of air is so much less than that of water it is evident that for a given pressure the head will be far greater in the case of air. But the velocity of discharge is dependent only on the distance fallen, which is represented by the head, whether real or ideal. As a consequence, air under a stated pressure escapes at vastly higher velocity than water under the same conditions. Calculated in the same manner the velocity of escaping air under a pressure of 21.7 lb. per sq. in. is 1626 ft. per sec. By employing formulæ based upon this theory the elaborate basis tables published by the B. F. Sturtevant Company have been calculated.

From the preceding discussion it is evident that the pressure created by a given fan varies as the square of its speed—that is, doubling the speed increases the pressure fourfold. The volume of air delivered is, however, practically constant per revolution, and therefore is directly proportional to the speed.

The work done by a fan in moving air is represented by the distance through which the total pressure is exerted in a given time. As ordinarily expressed in foot-pounds, the work per second would, therefore, be the product of the velocity of the air in feet per second, the pressure in pounds per square foot, and the effective area in square feet over which the pressure is exerted. From this it is evident that the work done varies as the cube of the velocity, or as the cube of the revolutions of the fan—that is, eight times the power is required at twice the speed. The reason is evident in the fact that the pressure increases as the square of the velocity, while the velocity itself coincidently increases; hence, the product of these two factors of the power required is indicated by the cube of the velocity.

The actual work which a fan may accomplish must depend not only on its proportions, but upon the conditions of its operation and the resistances which are to be overcome. Evidently it is improper to compare fans when operating under such conditions that these resistances cannot be definitely determined. The simplest and most natural condition of operation is that in which the fan is operated without other resistance than that of the case—that is, with open inlet and outlet. For proper comparison of different fans the areas through which the air is charged should bear some constant relation to the dimensions of the wheels themselves.

It has been determined experimentally that a peripheral discharge fan, if inclosed in a case, has the ability if driven at a certain speed to maintain the pressure corresponding to its tip velocity over an effective area which is usually denominated the "square inches of blast." This area is the limit of its capacity to maintain the given pressure. If it be increased the pressure will be reduced, but if decreased the pressure will remain the same. As fan housings are usually constructed, this area is considerably less than that of either inlet or outlet. It therefore becomes necessary in comparing fans upon this basis to provide either the inlet or outlet with a special temporary orifice of the requisite area and the proper shape, and make proper correction for the contracted vein. The fan is thus, in a sense, placed in a condition of striction of discharge, which it approaches in practice only in so far as the resistances of pipes, passages and material through which the air must pass have the effect of reducing the free inlet or outlet of the fan.

The square inches of blast, or, as it may be termed, the capacity area of a cased fan, may be approximately expressed by the empirical formula:

$$\text{Capacity area} = \frac{D\ W}{x}.$$

In which D = diameter of fan wheel, in inches, W = width of fan wheel at circumference, in inches, and x = a constant, dependent upon the type of fan and casing.

The value of x has been very carefully determined by the B. F. Sturtevant Company for different types of fans; but these values must be applied with great discretion, acquired through experience and a thorough knowledge of all the conditions liable to affect the fan in operation.

A Noteworthy Single Phase Equipment.

It is announced that the Washington, Baltimore & Annapolis Railway Company has finally adopted the single phase system and has placed contracts for the entire electrical equipment. This is one of the most important orders placed for alternating current equipment in this country. The original promotors of this line were the first to adopt the single phase system. Some three years ago contracts were let for the construction of the line, but due to financial difficulties the road was never built. It will be interesting to compare the electrical equipment proposed at that time with the present equipment which has been ordered from the General Electric Company, Schenectady, N. Y.

In the former plans it was intended to use a trolley potential of 1,000 volts, current being delivered at a frequency of 16 2-3 cycles per second. The present contract calls for a trolley potential of 6,600 volts at a frequency of 25 cycles per second. On the cars four motors were to be used, each having a capacity of 100 h.p. The new car equipments will consist of quadruple GEA-603 motor equipments for direct or alternating currents, each motor having capacity of 125 hp. While the first would have driven the cars at about 40 miles per hour the new arrangement will enable express trains to attain a speed on tangent level track of 60 miles per hour. Some 60 miles of road will be operated. The main line will extend from Baltimore to Washington, and a branch line from a point near Odenton, known as Academy Junction, to Annapolis.

Power for the new road will be purchased from the Potomac Electric Company, Washington, D. C., and will be delivered at 6600 volts, three phase, to a transformer substation located about 3 miles from Chesapeake Junction. To obtain a balanced load on the three phase generators the current as received at the substation will be changed from three phase to two phase by groups of two transformers connected three phase on the 6600-volt primary and two phase on the secondary side. Half of the transformers will have the secondaries wound for 6600 volts and the other half for 33,000 volts. The 6600-volt winding will all be connected in parallel on the same phase, supplying single phase current to the trolley as far as Academy Junction. The 33,000-volt secondary windings will all be connected in multiple on the second phase, to the 33,000-volt transmission line which will supply current to a step-down transformer substation located at Academy Junction. The Chesapeake Junction substation will contain seven 800-kw. water cooled transformers, three with 33,000-volt secondaries, one of the latter transformers being a reserve.

At Academy Junction there will be four water cooled transformers, 25 cycles, 900 kw., reducing the single phase 33,000-volt current of the transmission line to 6600-volt current suitable for delivery to the cars. These transformers will supply the Baltimore and Annapolis sections of the line.

The substation at Academy Junction will be located adjacent to the car barns. For greater safety in inspecting and handling the cars all of the trolley circuits in the car barns will be arranged for 600-volt direct current, and for this purpose two 300-kw. motor generator sets will be installed in the transformer substation, changing the 6600-volt alternating current to 600-volt direct current. The motor end of these motor generator sets will be connected directly to the trolley circuits, one phase being led from the trolley coming from Chesapeake Junction and the other from the Academy Junction transformers. A feeder regulator will be placed in one phase so that the motor generator sets will act as balancers, permitting the Academy Junction transformers connected on phase "B" to feed into the trolley line supplied by the Chesapeake transformers on phase "A." In addition to acting as balancers and to supplying current to the cars in the barns, the motor generator sets will also supply direct current to the motors in the repair shops located at this point.

Government regulations within the District of Columbia prohibit the use of the track return, so that within this section the cars will be operated with a double trolley. This portion of the road, as well as that within the city of Baltimore, is at present operated by direct current, and the new cars are designed to operate on direct current over these sections of the line. The engineering work is in charge of the Roberts & Abbot Engineering Company, Cleveland, Ohio.

Henry Chess.

A few days ago in Pittsburgh passed away one of that old school of men who laid the foundation for the commercial power and industrial greatness which have

HENRY CHESS.

made the Iron City the wonder of modern times. He was one of the kind seldom heard of in public print, but was ever to be found with soiled hands amid whirling machinery, surrounded by busy mechanics, working in a cloud of dingy smoke and racking noise appreciated only by those familiar with Pittsburgh. Henry Chess, who died on October 6, three hours after being stricken with apoplexy while seated in his office chair in the factory of the Central Expanded Metal Company, was within a few days of 71 years of age. He was literally cut down in the harness, having been busy as usual during the forenoon of the day on which he expired. For 53 years he had toiled among the busy men of that city, and though but slightly known as compared with many of the modern luminaries of the steel world he had done not a little in adding to the measure of his city's achievements.

His grandfather was a fur trader in the Allegheny valley and his father, David Chess, was a building contractor, whose education was obtained in a log school house built without the use of a single ounce of metal and with a hole in the roof for its chimney. In 1842 David Chess came East over the Allegheny Mountains by stage, and going to Taunton, Mass., he bought of Albert Field two small nail and tack machines which became the "plant" of the Anchor Nail and Tack Works established in that year in Pittsburgh. These two machines were set up in a carpenter shop, were operated by horse power and made the first tacks produced west of the mountains. The proprietorship was in the name of Elms & Chess, which later became in succession Campbell & Chess; Chess, Wilson & Co.; Chess, Smyth & Co.; Chess, Cook & Co.; and finally Chess Brothers, which has been the firm name for more than 15 years.

Henry Chess, after a course in the public schools and graduation at Travilla Academy, went into his father's works in 1853, and from nail feeder passed through every branch of the business to the senior partnership in the leading manufacturing establishment of its kind in Pennsylvania. His firm made every form of tack and nail, from the tiny size of which it took 15,000 to make a pound to the spike which counted but two and one-half to the pound. In the early '80s the wire nail came into competition with the cut nail and to-day it has almost a monopoly, but it was only within the present year that the Anchor Nail and Tack Works stopped its last machine, sold the equipment and closed its doors on the South Side of Pittsburgh, leaving two and a half acres of valuable ground to be turned to other uses.

In 1888 the firm took up the manufacture of expanded metal, a new invention, and developed that to a business of magnificent proportions. Its plant at Rankin, further up the Monongahela River, covering six acres, is now running double turn with an annual capacity of almost 50,000,000 square feet of material. The help of Henry Chess was conspicuous in producing a machine two years ago which, weighing 60 tons, being 12 ft. in length, slits and expands steel 5-16 in. thick, running 60 strokes per minute, produces 100,000 sq. ft. of mesh per day. In all the later years Henry Chess was the mill manager and gave his entire time to developing, improving and managing the mechanical end of a business requiring unusual skill and unending patience. He belonged to that school of business training which operates on a basis of actual capital, and which gives full 16 ounces to the pound. His personal career was not conspicuous but with the quiet and unassuming air of a mechanical genius he did things that made a mark in the upbuilding of a great industrial center. To Henry Chess all acquaintances were friends and with him all employees were co-laborers. He is survived by a widow and two brothers, Walter and Harvey B. Chess, who have been associated with him in business during his entire career.

The Canadian Steel Bounties.

A recent article in the Ottawa *Citizen* expresses the sense of the Canadian steel interests on the subject of the bounties. It is as follows:

"The building of the Grand Trunk Pacific and the retracking and double-tracking of the Canadian Pacific Railway and other trunk lines will in the near future require a very large amount of steel, and it is eminently desirable that Canada should not have to import any more than can possibly be helped from outside countries.

"The statement for the year ending in June last shows that the bounties paid out by the Government amounted to $3,088,407. Of this over one-third went to the large iron and steel companies in Nova Scotia, and considerably over $500,000 to the Algoma Steel Company at the 'Soo,' the chief producer of railroad steel. The fact that the latter company has only been rescued from financial difficulties within the past two years indicates that the steel industry in Canada has not yet reached that assured position which would enable it to successfully compete unaided with the great steel corporations across the line. It is likely at the next session of Parliament the question of continuing these bounties will arise, and the Government could not do better than renew them."

THE IRON AGE

1855—1906.

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The Blast Furnace Situation.

The value of monthly statistics of pig iron production in the United States is emphasized by the blast furnace figures published in the last issue of *The Iron Age*. It was there shown that the turn had come at last from the practically unbroken decline in pig iron production which followed the high record of 2,165,632 tons made in March by the coke and anthracite furnaces of the country. From that figure to the 1,926,736 tons produced in August, also a month of 31 days, the decline is 238,896 tons, making the yearly rate indicated by the August production 2,750,000 tons less than that of March. With consumption tending toward a scale greater than that of March the decline in the rate of production shown month by month was bound to result in the market conditions chronicled since the beginning of August, with prices advancing and consumers accenting the scarcity by an actual scramble for early delivery iron.

In the figures below the course of production this year is indicated in a way that throws some light on the present situation and points to the increase that must be made in the last quarter of the year to bring the output for the second half up to that for the first six months. The production of Northern steel works furnaces is stated separately, that of all the Alabama furnaces being included with the merchant product, since their merchant metal and that going to connected steel works cannot be separated. The average for the first six months of the year is calculated from the figures of the American Iron and Steel Association.

Production of Coke and Anthracite Blast Furnaces in 1906.—Gross Tons.

	Steel works furnaces.	Merchant furnaces.	Total.
Monthly average, first half of 1906	1,337,812	728,217	2,066,029
July	1,323,391	690,011	2,013,402
August	1,237,485	689,251	1,926,736
September	1,264,380	706,582	1,970,962

It appears that while September made a distinct upturn from the low point reached in August, the output for that month was still nearly 100,000 tons below the monthly average for coke and anthracite furnaces in the first six months of the year. The steel works furnaces are not only actually but relatively further behind their active capacity in the first half of the year than are the merchant furnaces. And while foundry iron has advanced more rapidly than steel making irons in recent weeks, the comparative moderation in the latter has been due largely to the fact that the chief consumer has appeared but rarely as a buyer of pig iron. Steel works outputs, and in turn finishing mill outputs, have been gauged to the supply of pig iron, and the latter has only been augmented as judicious purchases could be made in the market without creating excitement. It is a fair conclusion that if the situation of the past few months had come upon the iron trade before the days of consolidations, the competitive buying of pig iron by various steel companies, each acting on its own initiative, would have sent Bessemer and basic irons several dollars a ton above the level of to-day.

It is to be noted that while the September pig iron production shows a gain over August, the last quarter of the year must show some high monthly averages to bring the output for the second half up to that for the first half. It will mean a monthly average of 2,161,725 tons in October, November and December for the coke and anthracite furnaces, or about 191,000 tons a month more than the average for July, August and September. While every effort will be put forth to make October a record month, the weekly capacity active on October 1—469,665 tons—points to a total for the month of but 2,079,945 tons, though this is likely to be increased. It is questionable, however, if production will be brought up sufficiently in the remainder of the year to make the output in the second half exceed the total of 12,602,901 for all furnaces, including the charcoal stacks, in the first six months of 1906.

Of the 20 blast furnaces, having an estimated annual capacity of 2,662,000 tons of pig iron a year, which the American Iron and Steel Association reported in course of erection on August 1, four, with an estimated annual capacity of 455,000 tons, are now running and are represented in the active capacity reported for October 1. From the remainder are to be deducted the four Gary furnaces, one Bethlehem and one Colorado, for all of which the time of completion is uncertain. There are left for consideration 10 furnaces, with an annual capacity of 1,338,000 tons. Before the close of this year five of these furnaces, one in Alabama, two in Ohio, one in Illinois and one in Wisconsin, with a total annual capacity of 520,000 tons, will probably be in blast, most of them before the close of November. Four of these will make iron for the market. From the remaining five furnaces—three with a capacity of 578,000 tons a year representing steel works and two with a capacity of 240,000 tons a year making foundry iron—little is to be expected in the first quarter of 1907. The immediately available additions to foundry iron capacity appear to be by no means formidable, and if consumption continues on the present scale a moderate inflow of foreign iron may yet be seen.

The Industrial Building Outlook for 1907.

Nothing but a decided and wholly unexpected change in business conditions can stand in the way of an extraordinary amount of new industrial building next season. In spite of a very great aggregate of new shop, mill and factory construction during 1906 there are comparatively few manufacturing establishments which are not filled to the limit of present capacity. Enlargements have been absorbed into each manufacturing unit with almost incredible swiftness, and if provision is to be made for the growth of business, which continues steadily and to a large extent normally, provision must be made for housing enlarged producing facilities. Otherwise deliveries, already slow to the point of constant aggravation to both producer and consumer, will reach a point which will be really troublesome. Optimism is uppermost in almost every line of manufacturing, and few believe that there is danger of a lull in demand for a long time to come, certainly not before the end of 1907. Whatever the future may have in store in the way of factors which will change conditions the manufacturing community believes in the market, and will plan accordingly.

Instances are constantly coming to light of manufacturers making detailed plans for large extensions to their

works next season, or for entirely new and more modern plants. There appear to be few who are not considering enlargements, with a probability of carrying them out within the next six months. Decisions in a majority of cases will not be made until well into the winter, partly because it is considered not to be necessary if the work is not to begin until after the frost is out of the ground, and partly because owners wish to wait until the last moment in order that they may view the conditions of 1907 at the closest possible range. It may be well in such conservative instances to watch the markets for building materials, lest too long delay will make building impossible until late into the season. A great deal of new construction, however, will be undertaken during the cold months, even in the Northern States, in order that new floor space may be available at the earliest possible moment.

Very many industries are largely dependent upon new industrial construction and improvements for their prosperity. They furnish materials for building, millwright supplies and equipment of all sorts, including machinery, tools and power. These will all prosper next season. A few branches of trade will not be good customers, the exceptions including the woolen manufacturing industry, which is not so prosperous accordingly as other departments of manufacturing. The other exceptions seem to be less important. Running through the great departments of industry, line after line is found to be exceedingly busy. Complaints of too low prices are occasionally heard, but not from customers, and it is certain that practically every one is making money. Payments are prompt, which is an important element in considering future business.

Of course the whole general condition goes back to the final consumer of manufactured products, the public, and to the demand from other countries. The great crops of the year, coupled with the big balance of exports over imports, and the enormous additions to the country's wealth from all forms of productive enterprise must reflect themselves in the manufacturing community in enlarged capacities, and there would seem to have never been a time when the general demand would result in a greater aggregate of industrial growth.

Piracy in Manufacturing.

The imitation of a popular article by competing manufacturers is by no means a new or modern development of commercial enterprise. The practice is probably as old as the mechanical arts. Nevertheless it is as reprehensible to-day as when it was begun by somebody who lacked the ingenuity to bring out a meritorious production of his own, but sought to profit by the duplication of an article which had won for itself a widely recognized standing in the trade. The practice is fitly named piracy. It filches from another the well earned reward of his genius or mechanical ability. It robs him of trade which would otherwise have gone to him as the originator. The more clever the device the more likely it is to be copied, unless it is protected by patents, backed up by the means and disposition to punish infringers. The belief is unfortunately too common that if an article is not protected by patents it is open to reproduction by anybody who may choose to take up its manufacture. This is true with regard to staple goods, but not in the case of a finished product which by its form or its mechanism meets special requirements. A reputable manufacturer is clearly above adopting such methods of increasing his business, his honor and his pride alike stimulating him to win a reputation for products of his own creation. There are, however, unscrupulous people in every branch of trade and they are to be found among manufacturers as numerously as elsewhere. Stove manufacturers have for many years been wrestling with the problem of effectively checking the operations of those who imitate a stove as soon as it is found to have good selling qualities. Manufacturers in other lines are as seriously harassed. Commercial honesty would be greatly promoted if buyers could be educated to insist upon being furnished with an original article and refuse to take the counterfeit.

The Advance of the Blast Furnace Gas Engine.

It would appear that in comparison with Germany and Belgium, which are pointed to as particularly forward in the employment of gas engines driven by blast furnace gases, the United States is on the way to a better position than has been generally credited. It took several years of actual experience abroad with the economies of gas engine operation at blast furnaces to prepare the way for the first important installation in the United States, and similarly there was a disposition on the part of all other American steel companies to allow the pioneer in this country to have a monopoly of the forward movement for a number of years. The expense of continued experimentation, of the frequent replacement of parts, of the improvement of gas cleaning apparatus and of coping with other unsolved problems was not calculated to encourage instant following of the example set at Buffalo. In his "Manufacture and Properties of Iron and Steel," published in 1903, H. H. Campbell made the confession that it was not a proud position American engineers had occupied in waiting for others to do the work of developing the blast furnace gas engine, but he added what was quite true—that American steel companies were richer than if they had been building gas engines for the preceding half dozen years, as the Germans and Belgians had done.

Now that the way has been blazed development is likely to be rapid, particularly since the United States Steel Corporation has undertaken so large a programme of gas engine utilization as is indicated by the installations detailed in other columns. In 1901 a compilation of all the gas engine plants at blast furnaces in Germany, Belgium and France showed a total of 81,125 hp. The installations for which the United States Steel Corporation has given contracts amount at the start to 102,000 hp., or 25 per cent. more than the total in all European countries five years ago. If history is to repeat itself, this movement is destined to illustrate anew the American way of carrying to a new high point metallurgical development in which the initiative was taken abroad. It was natural that the United States Steel Corporation, with a voluminous schedule of new work always ahead of it, should avail itself of the opportunity for introducing gas power in a variety of situations. It is evident from the scale on which it is installing gas engines—a total of 44,000 hp. for furnishing blast and 58,000 hp. for electrical service—that the Steel Corporation's gas engineers are satisfied that the problem of gas cleaning has been solved and with satisfactory economies. To have 10 per cent. of the corporation's power requirements supplied by gas engines signifies that the proposition is not taken up as an experiment. At the same time it is apparent from the provision of steam driven reserves that the types of gas engines represented in the product of the four American builders having the corporation's contracts are not finalities. There is such a diversity of conditions in the installations decided upon as could not

be found at the works of any single steel company, and the data available within two or three years will decide much as to the lines of progress in the United States. At present most of the steel companies outside the Steel Corporation maintain the attitude of onlookers. The large pioneer operation at Buffalo has pointed out some of the things to be avoided. Other important modifications of European practice are to be expected.

At the same time the Steel Corporation's decision to test the claims made for the modern gas producer in supplying gas for explosive engines may lead to interesting results in that rapidly opening field. The established claim of an average of one horsepower-hour per pound of coal has awakened a keen interest in the possible adaptations of the producer gas driven engine and this is added to by the more recent development of effective means of breaking up the tar that has been a drawback where bituminous coal was used in producers for power generation.

PERSONAL.

Prof. Henry M. Howe of Columbia University, New York, has recently received from the Czar of Russia the Order of the Knighthood of St. Sanilas in recognition of his work in metallurgical research. The honor was conferred by Baron Rosen.

Stuart R. Elliott, formerly mining engineer for the Cleveland-Cliffs Iron Company at Negaunee, Mich., and for some time in Cuba conducting mining operations, has returned to Negaunee to become superintendent of the Cleveland-Cliffs Company's properties there.

H. A. Deuel has succeeded A. H. Helander as chief engineer at the Minnequa plant of the Colorado Fuel & Iron Company. Mr. Helander, on retiring from the position some time ago, became connected with the Mesta Machine Company at Pittsburgh.

A. N. Spencer, technical engineer of the Harbison-Walker Refractories Company, Pittsburgh, Pa., has just returned from a six months' trip among the smelters in Mexico, Southwestern and Western United States and British Columbia.

Charles F. Putnam, president of the Putnam Machine Company, Fitchburg, Mass., has returned from a several months' European trip.

Dr. Nelson P. Hulst, president of the Four Wheel Drive Wagon Company, Milwaukee, Wis., has been elected president of the University Club of that city, and S. L. G. Knox, general manager of the Bucyrus Shovel Company, located near Milwaukee, vice-president.

The Wisconsin Central Railway, with headquarters at Milwaukee, Wis., has recently undergone important changes in its executive officers, both the former president, H. F. Whitcomb, and the vice-president, Howard Morris, retiring for the election of representatives of the new owners of the road. Mr. Morris has become president of the McKenna Process Company, which is engaged in the renewal of old railroad rails, with mills at Joliet, Ill.

W. H. Ham, formerly reinforced concrete engineer of the Tucker & Vinton Corporation, is now the concrete engineer of the General Fireproofing Company, Youngstown, Ohio, and 156 Fifth avenue, New York City, manufacturer of expanded metal, herringbone expanded steel lath, twisted lug bars and girder frames.

Joseph Morgan, Jr., will be succeeded as chief engineer of the Cambria Steel Company, Johnstown, Pa., by John Gocher on November 1. Mr. Morgan has been in the company's service for many years and retires from active work to enjoy more leisure, being retained in the capacity of consulting engineer. Mr. Gocher has earned his advancement by filling other responsible positions with the company.

Wm. Weaver, rolling mill superintendent at the Bessemer plant of the Republic Iron & Steel Company, Youngstown, Ohio, has accepted a similar position in connection with the new steel plant of Milliken Bros., Incorporated, on Staten Island.

L. C. Bihler, traffic manager of the Carnegie Steel Company, Pittsburgh, with some friends, is making a tour of Colorado.

Eugene N. Hunting, formerly engineer for the Cummings Structural Concrete Company, Pittsburgh, is now associated with the General Fireproofing Company, Youngstown, Ohio, as engineer in the reinforced concrete department.

Rudolph P. Miller, late chief engineer of the Bureau of Buildings, New York City, has opened an office as consulting engineer at 527 Fifth avenue, New York City.

Robert W. Flenniken, formerly secretary and treasurer of the Cherry Valley Iron Company, Pittsburgh, has resigned and is now at Atlantic City for recuperation. He is succeeded by W. H. Schoen, who is also actively identified with the Pressed Steel Car Company, Pittsburgh.

David C. Beaman has retired as a member of the Board of Directors of the Colorado Fuel & Iron Company and has been succeeded by Robert C. Clowry, of New York, president of the Western Union Telegraph Company. Mr. Beaman will continue as counsel of the company.

At Tuesday's meeting of the stockholders of the American Locomotive Company, William M. Banmun, Frederick H. Stevens and Charles Miller, whose terms had expired, were re-elected as directors. R. J. Cross, vice-president, was elected a director to fill the vacancy caused by the resignation of E. C. Converse.

Labor Notes.

The Boston Central Labor Bureau has drafted a bill for presentation to the Massachusetts Legislature, which embodies some of the most radical provisions of the British labor act now before Parliament, especially those sections relating to injunctions. Following are the exemptions as embodied in the act:

1. A combination, agreement or contract to do, or procure to be done, or not to do or procure not to be done, any act which would not be punishable as a crime if committed by one person.
2. The lawful and peaceful use of the public highways.
3. The establishment of pickets or patrols in a peaceable and reasonable manner, if the same be done with the object of obtaining or communicating information or persuading some persons to work, or to abstain from working.

The bill will not become a law, unless the Legislature departs from its precedents of recent years. But it shows the results of radical action by a legislative body in stimulating similar legislation in other countries or in other States.

An interesting experiment is being made under the auspices of the National Founders' Association at Chicago, which has for its object the teaching of the rudiments of foundry practice to green hands. The school has been established in an office building located at 182 Dearborn street, which has facilities for a class of eight. Up to the present time it has been found that with a course of instruction covering a period of 13 days the men have secured a fair theoretical knowledge of molding and after a brief experience in the foundry have been developing into quite skilful workmen.

The barb wire and mesh fence departments of the Worcester Works of the American Steel & Wire Company have been moved to Pittsburgh and Cleveland, taking about 100 tons a day from the volume of the Worcester production. The Worcester Works, formerly those of the Washburn & Moen Mfg. Company, are being devoted more and more to wire specialties and large improvements are being made to increase the capacity of these departments, notably that of the insulated wire department.

The American Metal Company, Ltd., New York, has increased its capital stock from $2,000,000 to $3,000,000.

NEWS OF THE WORKS.

Iron and Steel.

A representative of J. A. Moore, Seattle, Wash., and associates, who recently bought the charcoal furnace at Irondale, Wash., has since been in Pittsburgh contracting for the erection of new stoves and making purchases of firebrick and other supplies. The new retorts, for which an order has been given, are expected to reduce materially the cost of making charcoal. The wood used at this plant is rich in turpentine, tar and pitch.

The Wheeling Steel & Iron Company, Wheeling, W. Va., recently purchased some more property adjoining its plant, which will be used for extensions the exact nature of which has not been determined.

The continuous sheet mill of the American Sheet & Tin Plate Company at South Sharon, Pa., was started October 15 after an idleness of some months.

No. 2 furnace of the Republic Iron & Steel Company at Haselton, Ohio, has been started. No. 3 stack, now being built, is expected to be ready for operation about December 1.

A project for a steel plant to employ a new process is under consideration at Bessemer, Ala. A recent meeting of citizens at the office of the Bessemer Coal, Iron & Land Company appointed a committee to undertake the organization of a stock company in which local capital should be largely interested. G. P. Martin is chairman of the committee. It is stated to be the intention to capitalize the company at $100,000, which those promoting the enterprise say will be sufficient to build a plant and furnish working capital.

General Machinery.

The Romberger Foundry & Machine Company, Winona, Miss., recently incorporated with a capital stock of $25,000, will make arrangements at once for the erection of a foundry and machine shop 50 x 60 ft. A part of the machinery required has already been purchased from the Niles-Bement-Pond Company, American Tool Works Company and Fairbanks, Morse & Co. Prices and catalogues are still desired on small tools. H. R. Romberger is president and manager.

The Hazel Machine Company, Chicago, has been incorporated and is now operating a shop at 954 East Garfield boulevard for the repairing of automobiles, machinery, &c.

The annual meeting of the stockholders of the Aurora Automatic Machinery Company, a subsidiary of the Independent Pneumatic Tool Company of Chicago and New York, was held at the offices of the company at Chicago on October 5 and the following directors were elected for the ensuing year: James B. Brady and W. O. Jacquette of New York City; John P. Hopkins, John D. Hurley, A. B. Holmes, M. S. Rosenwald, Simon Florsheim and J. J. McCarthy of Chicago, and C. E. Erikson of Aurora. Subsequently the following officers were elected: John P. Hopkins, president; W. O. Jacquette, first vice-president; John D. Hurley, second vice-president; C. E. Erikson, treasurer, and A. B. Holmes, secretary. The directors declared the regular quarterly dividend of 3 per cent.

The Patterson Tool & Supply Company, Dayton, Ohio, has sold its 13½-in. lathe business, which it formerly conducted under the name of the Miami Valley Machine Tool Company, to three gentlemen of Dayton who have an established manufacturing business and who will operate their business under the name of the Miami Valley Machine Tool Company. These gentlemen have arranged with the Patterson Tool & Supply Company for additional equipment for their plant, which will put them in a position to place the lathes on the market promptly. The exclusive sale of the lathes in the States of Ohio and Indiana has been given to the Patterson Tool & Supply Company, whose Indiana business is looked after by A. G. Schonacker, 508 East Twenty-third street, Indianapolis, Ind. No further machine tool equipment is required at the present time by the new owners of the lathe business.

The Polson Iron Works, Limited, Toronto, Ont., is making a number of improvements to its plant, including the erection of a new machine shop, 80 x 300 feet, at a cost of $50,000, and is installing electric traveling cranes and up to date machinery.

The following are the officers and directors of the Pleasanton Foundry & Machine Company, Pleasanton, Kan., which was recently incorporated and which is building a plant for the manufacture of gas and gasoline engines: T. R. Blakey, president; Henry Plumb, vice-president; John A. Hall, secretary; B. F. Blaker, treasurer, and E. C. Smith. Machinery equipment will shortly be purchased.

The B. F. Sturtevant Company, Boston, Mass., recently equipped the following large manufacturing plants with complete heating and ventilating systems: Aschroft Mfg. Company, Bridgeport, Conn.; J. R. Baker & Sons, Kendallville, Ind.; J. K. Mosser Company, Newberry, Pa.; Eastern Mfg. Company, South Brewer, Maine; complete forge shop equipment for the School of Science, Wahpeton, N. D.; Lynn Manual Training School, Lynn, Mass.; Thomas Hoyne High and Manual Training School, Chicago, Ill.; high pressure blowers of its new design rotary type, M. Rumely Company, Laporte, Ind.; National Meter Company, South Brooklyn, N. Y.; Philadelphia Caramel Company, Camden, N. J. In connection with the heating and ventilating equipment for the new office building of the Brown & Sharpe Mfg. Company, Providence, R. I., the B. F. Sturtevant Company will furnish three engine driven steel plate fans and three similar fans driven by direct connected Sturtevant motors.

The two buildings to be erected at Welland, Ont., by the Canada Forge Company will be 50 x 125 ft. each. The equipment has been purchased.

The Acme Tool & Mfg. Company, Braddock, Pa., intends to move its plant to a new location where it will largely increase its output.

Power Plant Equipment.

The Westinghouse Electric & Mfg. Company, Pittsburgh, is being awarded an increased number of Government contracts. A contract just closed calls for a large amount of power generating apparatus to be installed in the Navy Yard at Norfolk, Va. In part it consists of two 1000-kw. steam turbine generating units, one 500-kw. steam turbine generating unit, two 50-kw. steam driven exciter units, and five 50-kw. motor generator sets. An interesting part of the equipment is the switchboard, which will have 42 panels. A large amount of auxiliary apparatus is included in the contract.

The Crocker-Wheeler Company, Ampere, N. J., has shipped within the last few weeks nine carloads of electrical machinery, exclusive of other smaller shipments, to the following large companies: Four carloads to the National Tube Company, including motors of various sizes; two carloads, Lehigh Portland Cement Company, of one direct current generator and a number of motors of various sizes; two carloads, consisting of alternating current generators, Snow Steam Pump Company, and one carload of its form L small motors to the Crocker-Wheeler Company, San Francisco, Cal., which is to fill part of the company's orders taken since the fire. This is the second carload of these small motors which have been rushed to the Pacific Coast, besides numerous other larger apparatus which has been sent direct to customers. These train load shipments show the condition of the market for high grade electrical machinery.

The Fairbanks-Morse Mfg. Company, Beloit, Wis., will build an addition to its plant which will be 75 x 300 ft. The work is being done by the company's own men and the equipment for the shop has all been purchased.

The Gies Gear Company, Detroit, Mich., has succeeded Frank G. Gies & Co., and has been incorporated with a capital stock of $50,000 to manufacture the Gies reverse gear for marine gasoline engines. Premises have been leased at 345-347 Bellevue avenue. In addition to the machinery formerly owned by Frank G. Gies & Co., the new corporation has purchased a King boring mill, Greenfield universal grinder, Blount grinder, Barnes drill press, Bardons & Oliver turret lathe, and Cincinnati milling machine. The officers of the company are: Howard E. Putnam, President; Frank G. Gies, vice-president; Clarence J. Gies, secretary, and Harry D. Morton, treasurer.

The Gadsden & Attalla Railway Company, with headquarters at Gadsden, Ala., is erecting a $125,000 electric power house, which will be two stories high, 50 x 100 ft. Contracts for two 500-kw. turbines have been let to the Westinghouse Machine Company, and the other electrical apparatus, including two 200-kw. rotary converters, switchboard, &c., to the Westinghouse Electric & Mfg. Company. Contracts for the condensers and pumps were let to Henry R. Worthington, New York.

The Glastonbury Power Company, which will establish a hydraulic electric plant on Roaring Brook, near Hartford, Conn., has awarded the contract for the construction of reservoir and plant to J. G. White & Co., Incorporated, New York. A dam 700 ft. long and 60 ft. high will be constructed to supply power to two turbines of 750 hp. each. Electric power will be transmitted at high tension for power purposes.

The Fox Reversible Gasoline Engine Company, Newport, Ky., recently incorporated with a capital stock of $100,000, has secured a large plant in that city where it will continue the manufacture of the Fox reversible engines on a much larger scale than heretofore. The large extension of its business was justified by the increase in sales of 1906 under a partnership arrangement. Dr. E. E. Smith is president, M. B. Dean vice-president, A. C. Perry secretary, and A. G. Dean treasurer. The Messrs. Dean control the Dean Gasoline Engine & Foundry Company, maker of stationary engines, but the two companies are distinct and separate.

The Lake Erie Iron Works, Cleveland, Ohio, will erect a new power plant for which considerable new equipment will be needed.

Bids will be opened on October 24 at the office of the Department of Water Supply, Gas and Electricity, New York, for furnishing surface condensers for the Millburn pumping station, Baldwins.

The Police Department, at its office, 300 Mulberry street, New York, will open bids on October 22 for installing steam boilers for heating purposes in the 33d, 43d, 48th, 49th, 51st, 52d, 53d, 55th, 56th, 61st and 64th precinct police stations.

Foundries.

C. W. George Everhart, president of the Challoner Foundry Company, Oshkosh, Wis., has closed a deal for the erection of a

steel casting plant in Oshkosh which will cost about $50,000. It will be erected near the Fox River on the west side, on land owned by the Challoner company. Mr. Everhart has made a contract with the Detroit Foundry Supply Company, Detroit, Mich., for the necessary machinery for the plant, but no haste will be observed in delivering the same, as the erection of the plant has been postponed until spring, owing to the inability to obtain materials for the buildings promptly. The main foundry building is to be 80 x 140 ft., and employment will be given to 50 men. The capacity of the plant will be 10 tons a day. Part of the output will be used in the plant of the Challoner company and the remainder will be distributed to the trade in Wisconsin and the Central West.

Francis M. McGinty, Alliance, Ohio, is at the head of a company which proposes the establishment of a steel casting plant at Alliance. The company will shortly incorporate with a stock of $150,000. The main building of the plant will be 76 x 254 ft., equipped with a 20-ton open hearth furnace, traveling cranes, &c.

The Defiance Machine Works, Defiance, Ohio, has been making some improvements to its plant, installing new cupola equipment and erecting an additional building for handling cores, the latter increasing the floor space which can now be used for foundry purposes. A new foundry has been contemplated and may be built some time next year.

The Standard Malleable Iron Company, Muskegon, Mich., will build an addition to its plant in the shape of a foundry 70 x 275 ft. New annealing furnaces will also be added. Equipment for the foundry has been arranged for.

The Fort Pitt Malleable Iron Company, Pittsburgh, has decided to make some large extensions to its plant at McKees Rocks. A 15-ton open hearth furnace will be installed, and an addition to the main foundry will be made that will provide room for 40 more molders. The annealing department will also be enlarged, and when these extensions have been completed the company will be able to melt about 1500 tons of pig iron per month.

E. D. Jones, Sons & Co., Pittsfield, Mass., manufacturers of paper mill machinery, are to make important alterations and enlargements to their foundry. The present building is to be made higher, a steel frame addition erected, and a 30-ton traveling crane will be installed. Equipment has been purchased.

The Machinists' Foundry Company, Muncie, Ind., recently organized to manufacture gray iron castings, is occupying the plant formerly used and operated by the Hanika Foundry Company. The new company will produce about 50 tons of finished castings per month.

The Pittsburgh Automatic Machine Company, Pittsburgh, Pa., manufacturer of malleable iron, brass, bronze and aluminum castings, is making a number of improvements to its plant, including the installation of an 8-ton reverberatory furnace, three 20-ton annealing furnaces and 15 molding machines in its iron department, and one 1200-lb. Steele-Harvey furnace in its brass foundry. A complete pattern shop is also being equipped. In the spring the company intends to install two 8-ton reverberatory furnaces and six 20-ton annealing furnaces.

Bridges and Buildings.

The Pittsburgh Steel Construction Company, Lewis Building, Pittsburgh, is doubling the capacity of its structural plant at Economy, Pa. Several new steel buildings are being erected and considerable new equipment in the way of plate shears, punches and riveters is being installed. A new power house is also being erected and a 30-ton crane built by the Alliance Machine Company, Alliance, Ohio, is being added. This company has a number of large contracts for structural work on its books and is running its plant to full capacity.

The Elkhart Bridge & Iron Company, Elkhart, Ind., has been awarded contract for bridges, arches, spans and bridge repairs at Goshen, Ind. The contract amounts to $27,613.

The St. Paul Foundry Company, St. Paul, Minn., has the contract for the steel work for a printing plant to be built at St. Paul for H. L. Collins. The work will require 190 tons of steel.

The Noelke-Richards Iron Works, Indianapolis, Ind., has been awarded contract for the structural steel work for a water power developer and transformer substation to be built at Chicago for the Sanitary District of Chicago. The tonnage of steel involved aggregates 133 tons.

The George H. Fuller Company, Chicago, has been awarded the general contract for a bank building to be erected at Tenth and Walnut streets, Kansas City, Mo., for the National Bank of Commerce of that city. It will be 14 stories, 115 x 160 ft., built of brick, steel and terra cotta, and cost $1,250,000.

The Des Moines Bridge & Iron Works, Des Moines, Iowa, is making improvements to its plant to provide for the rapid increase in business. In August 750 tons of iron work were turned out at the factory, which is being worked at fullest capacity all the time. The latest improvement is the installation of machinery for the manufacture of rivets and bolts. The company now uses 50 tons of rivets a month, a quantity which makes it cheaper to manufacture than buy them in the open market. An addition has been built to the forge shop on the west to provide space for the new machinery. At the south of the main shops an addition, 30 x 100 ft., has been built exclusively for the lighter bridge work, so that more room will be left in the main shops for the manufacture of steel frame work for buildings. The company has purchased a new punch and shear, heavy bending rolls, drill press and an Acme heading and forging machine, and will soon place an order for an angle shear. The company has just completed the 15-story R. A. Long building at Kansas City, containing about 1900 tons of structural steel, and is at present erecting 800 tons of steel in the Joplin Hotel, at Joplin, Mo. Other contracts include cement plants at Independence, Mo.; Hayes, Kan., and other points, aggregating about 1000 tons.

Fires.

The plant of the Metal Volatilization Company, Denver, Colo., was damaged $20,000 by fire last week.

The plant of the National Electric Supply Company at Alexandria, Va., was destroyed by fire October 8.

The plant of the South Zanesville Brick & Sewer Pipe Company, South Zanesville, Ohio, was recently destroyed by fire. The loss is about $30,000.

The repair shops of the Lake Shore Electric Railway Company at Fremont, Ohio, were destroyed by fire October 16. The loss is placed at $100,000.

The plants of the Lincoln Iron Works and the Boonton Iron & Steel Company at Boonton, N. J., were seriously damaged by fire October 16. The combined loss is placed at $40,000.

The radiator works of the Sodemann Heat & Power Company, at Edwardsville, Ill., were destroyed by fire October 16, the loss being about $40,000.

Hardware.

The Meyers Steel Fence Company has been incorporated at Buffalo, N. Y., with a capital of $500,000, to manufacture the Meyers patent steel fence posts and rails. The directors are C. H. Meyers, H. C. Minard and E. J. Smith of Buffalo, and P. L. Marvin of Orchard Park, N. Y.

The Hiett Plow Company, Dryden, Ark., recently organized by J. W. Hiett and others to manufacture the Hiett patent coulter plow, harrows, &c., will erect two buildings, one 40 x 60 ft. and the other 60 x 100 ft. Wood working equipment for the buildings will be furnished by Hall & Brown, St. Louis, and the blacksmith tools and machinery by the Beck & Corbitt Iron Company, St. Louis.

The Ansonia Novelty Company, Ansonia, Conn., manufacturer of shears, scissors and metal specialties, suffered a loss of about $7500 on finished stock and $1600 on building by a recent fire.

The F. W. Loll Mfg. Company, Meriden, Conn., has been organized in Connecticut to manufacture light hardware and has established its factory at 45½ Pratt street. F. W. Loll is the president and Clarence W. Ott the secretary and treasurer.

Miscellaneous.

The Knox Automobile Company, Springfield, Mass., is to build a four-story brick addition to its works, 50 x 100 ft. It will be devoted chiefly to machine shop purposes. The company states that it has let contracts for the necessary machine equipment.

The Electric Railway Equipment Company, Cincinnati, Ohio, will erect a plant near Wheeling, W. Va., 50 x 200 ft., which will be used for the manufacture of iron tubular poles. The plant will be equipped with special machinery which was made in the company's Cincinnati shops.

The McKinnon Dash Company, Buffalo, manufacturer of carriage dashes, fenders, &c., has purchased a plot of land 165 x 1000 ft., with frontages on the New York Central and Lackawanna railroads, and will erect thereon an auxiliary plant for the extension of the dash business, where railroad facilities will be provided, which are not available at its present plant on Amherst street. Contracts will soon be let for the construction and equipment of the new buildings.

The Niagara Electro-Chemical Company, Niagara Falls, N. Y., is soon to erect a large addition to its plant in that city. The new building will be 60 x 208 ft., of brick and steel construction.

D. McDonald & Co., Albany, N. Y., manufacturer of gas meters, will require very little new machinery for the plant they have in course of construction, as it is the intention to move their present equipment into the new building.

The Gayley Dry Air Blast.—The Brier Hill Iron & Coal Company has taken out a license to equip its furnace at Youngstown, Ohio, with a Gayley dry air blast plant. This is the first furnace to be equipped west of Pittsburgh. The other plants that are now building are at the works of the Warwick Iron & Steel Company, Pottstown, Pa.; the E. & G. Brooke Iron Company, Birdsboro, Pa., and at Cardiff Wales. Among Western furnaces the Brier Hill Iron & Coal Company has been in the lead in introducing modern improvements, having been the first in that territory to use fire brick stoves and, it is claimed, were the first to equip a laboratory

The Iron and Metal Trades

The enormous pressure upon our Iron and Steel manufacturing plants is increasing rather than decreasing and is spurring the managements to unusual efforts. It is reported that during the first 13 working days of the current month the Steel works of the United States Steel Corporation produced a daily average of 48,000 tons of Ingots, which if maintained would make the record for the month of October close to 1,300,000 tons of Steel.

Work at the highest pressure is assured all along the line for the first half of next year, and in some lines the commitments run well into the second half. Increasing interest centers in the supply of raw materials for next year and the prices demanded for them. Considerable sales of Lake Ores are reported at an advance of 50c. and as high as 75c. a ton above this season's figures.

The Steel Corporation has purchased large quantities both of West Virginia and Connellsville Coke, principally for delivery during the first half of 1907, although some important contracts are to run over the whole of the year. This means that the Steel Corporation is unable to cover all of its own requirements. The basis is said to be above $3, at oven, Connellsville.

Steel Billets continue scarce all over the country, and some moderate sized lots have been even purchased by the largest producers in the Pittsburgh District. In the Chicago District there have been fairly large sales to car builders of Forging Billets, and it is particularly interesting to note that a consignment of 13,000 tons of Foreign Forging Billets is soon expected there. They have been offered at $35, which, however, does not appear to tempt buyers.

The markets are stiffening in Pig Iron, and under the urgent demand for spot delivery considerably higher prices are ruling, both for Bessemer Pig in the Central West and for Foundry Iron in practically all sections of the country. In eastern Pennsylvania a Steel mill has placed the greater part of 20,000 tons of Basic Pig at $19.60, delivered.

Arrangements have been made for the importation of additional lots of Scotch Foundry and of Foreign Low Phosphorus Pig, and it looks as though more must come.

No transactions of any magnitude are reported by the Rail makers. The Structural and Plate mills are getting some good business, including some heavy tonnage from the car builders. The work for the Canadian Pacific, involving about 19,000 tons of Bridge material, on which American shops bid, has been awarded to a Canadian maker.

Western car builders have been placing further good orders for Iron Bars and the market is firm, both in this branch and in Steel Bars.

The manufacturers of Merchant Pipe have announced an advance of two points, equal to $4 per ton, on Black and Galvanized Pipe, and $2 on Casing. A large order just placed calls for 285 miles of 6-in. Pipe for the line of the Pure Oil Company from Pine Grove, W. Va., to Marcus Hook.

The market for Sheets and Tin Plate has been stiffening, with an increasing prevalence of premiums.

A Comparison of Prices.

Advances Over the Previous Month in Heavy Type, Declines in Italics.

At date, one week, one month and one year previous.

	Oct. 10, 1906.	Oct. 3, 1906.	Sept. 19, 1906.	Oct. 18, 1905.
PIG IRON, Per Gross Ton:				
Foundry No. 2, Standard, Philadelphia	**$21.00**	$21.00	$20.50	$17.25
Foundry No. 2, Southern, Cincinnati	**20.00**	20.00	19.00	15.25
Foundry No. 2, Local, Chicago	**21.50**	20.50	19.75	17.50
Bessemer, Pittsburgh	**20.35**	20.35	19.60	16.60
Gray Forge, Pittsburgh	**19.35**	19.35	18.35	15.85
Lake Superior Charcoal, Chicago	**21.00**	21.00	20.00	18.50
BILLETS, &c., Per Gross Ton:				
Bessemer Billets, Pittsburgh	28.00	28.00	28.00	26.00
Forging Billets, Pittsburgh	34.00	34.00	34.00	29.00
Open Hearth Billets, Phila	**33.00**	32.50	32.00	28.50
Wire Rods, Pittsburgh	**34.50**	34.50	34.00	32.00
Steel Rails, Heavy, Eastern Mill	28.00	28.00	28.00	28.00
OLD MATERIAL, Per Gross Ton:				
O. Steel Rails, Chicago	**18.00**	17.00	16.50	14.50
O. Steel Rails, Philadelphia	**18.50**	18.50	18.25	17.25
O. Iron Rails, Chicago	**26.00**	25.50	23.50	22.00
O. Iron Rails, Philadelphia	**25.50**	25.00	24.00	22.50
O. Car Wheels, Chicago	*19.25*	19.00	20.00	16.00
O. Car Wheels, Philadelphia	**20.75**	20.75	19.50	17.00
Heavy Steel Scrap, Pittsburgh	**16.75**	17.50	16.50	16.50
Heavy Steel Scrap, Chicago	16.50	16.50	16.50	14.50
FINISHED IRON AND STEEL, Per Pound:	Cents.	Cents.	Cents.	Cents.
Refined Iron Bars, Philadelphia	1.83½	1.83½	1.83½	1.83½
Common Iron Bars, Chicago	1.71½	1.71½	1.71½	1.80
Common Iron Bars, Pittsburgh	1.60	1.60	1.60	1.74¾
Steel Bars, Tidewater, New York	1.64½	1.64½	1.64½	1.64½
Steel Bars, Pittsburgh	1.50	1.50	1.50	1.50
Tank Plates, Tidewater, New York	1.74½	1.74½	1.74½	1.74½
Tank Plates, Pittsburgh	1.60	1.60	1.60	1.60
Beams, Tidewater, New York	1.84½	1.84½	1.84½	1.89½
Beams, Pittsburgh	1.70	1.70	1.70	1.70
Angles, Tidewater, New York	1.84½	1.84½	1.84½	1.89½
Angles, Pittsburgh	1.70	1.70	1.70	1.70
Skelp, Grooved Steel, Pittsburgh	1.57½	1.57½	1.57½	1.50
Skelp, Sheared Steel, Pittsburgh	1.60	1.60	1.60	1.55
SHEETS, NAILS AND WIRE, Per Pound:	Cents.	Cents.	Cents.	Cents.
Sheets, No. 27, Pittsburgh	**2.40**	2.40	2.40	2.15
Wire Nails, Pittsburgh	1.85	1.85	1.85	1.80
Cut Nails, Pittsburgh	**1.90**	1.90	1.80	1.65
Barb Wire, Galv., Pittsburgh	2.30	2.30	2.30	2.25
METALS, Per Pound:	Cents.	Cents.	Cents.	Cents.
Lake Copper, New York	**22.00**	22.00	19.25	16.62½
Spelter, St. Louis	*6.12½*	6.05	6.25	5.95
Lead, New York	*5.95*	5.90	6.00	5.25
Lead, St. Louis	**5.90**	5.85	5.85	4.95
Tin, New York	**43.40**	42.50	40.00	32.60
Antimony, Hallett, New York	**24.75**	24.50	24.00	12.25
Nickel, New York	45.00	45.00	45.00	40.00
Tin Plate, Domestic, Bessemer, 100 lb., New York	$3.94	$3.94	$3.94	$3.49

Chicago.

FISHER BUILDING, October 17, 1906.—(*By Telegraph.*)

The heavy buying of semifinished Steel to cover future requirements has been the feature of the week's developments in the Iron and Steel trade. Owing to heavy increases in its finishing capacity the Illinois Steel Company will have little surplus Steel after the first of the year, and the company's inability to take contracts for large specified tonnages has made it necessary for large consumers to look elsewhere for their Steel supply. Sales of Forging Billets aggregate 10,000 tons, at prices ranging from $34 to $35, and an inquiry for 5000 tons of Steel has just been received from a large axle maker. A consignment of 13,000 tons of foreign Axle Billets which is shortly expected has been offered in this market at $35, but this price does not interest prospective buyers. Billets amounting to 12,000 tons for the Union Pacific Railroad will be furnished by an Eastern mill, and it is probable that the Tie Plates for which this material was desired will likewise be rolled in the East. The Indiana Steel Company yesterday placed an order with the American Bridge Company for the erection of its Rail mill group of buildings and blowing engine house. The latter building will be 104 x 575 ft., and the total amount of Steel involved in the entire order aggregates 20,000 tons. Other building operations are only of minor importance, although the railroads are buying heavily for 1907, one Western road having inquired for 7000 to 10,000 tons of bridge material. Notwithstanding the pressure on fabricators the mills are close to specifications and shipments can be made of various shapes in from one to two weeks. Thus far this month the production of the Steel mills in the district shows a big increase over the same

period in September, and deliveries of all finished lines will improve proportionately. The advance of $4 a ton on Black and Galvanized Merchant Steel Pipe and $2 on Casing was not expected by the trade in view of the continued low prices which have prevailed in the face of the high cost of Skelp. Distributers, however, succeeded in covering for the fall months on the lower basis, and the trade is well supplied for the immediate future. Iron Pipe has also been moved up in price, although not officially, and is held at a three-point advance over Steel. Connellsville Foundry Coke has been advanced to $4 at the ovens, and By-Product Coke is firmly held on a basis of $6.40, Chicago. Furnace operators are covering their 1907 requirements at $3, Connellsville, equivalent to $5.35, Chicago. During the week the American Shipbuilding Company has been awarded contracts for 10 lake boats to be put in commission next year.

Pig Iron.—Further advances on Northern and Southern grades have been recorded during the week, and as the situation is wholly controlled by the producers still higher values are anticipated. Sales of carload lots of Southern No. 2 have been made on the basis of $18.50 to $19, Birmingham, and for first quarter delivery $17 to $17.50 is asked, while for the entire first half $16.50 is the minimum. Large consumers, such as the International Harvester Company, owing to the increased melt of their foundries, have come into the market for spot Iron, and other consumers, whose shipments are delayed, are likewise buying heavily for immediate requirements. Local operators are selling spot Iron at $22 for No. 2, and are asking $21 for the entire first half. The buying for future needs continues only on a limited scale, which indicates that consumers are pretty well covered through the first half. We quote as follows, f.o.b. Chicago:

Lake Superior Charcoal	$21.00 to $21.50
Northern Coke Foundry, No. 1	22.00 to 22.50
Northern Coke Foundry, No. 2	21.50 to 22.00
Northern Coke Foundry, No. 3	21.00 to 21.50
Northern Scotch, No. 1	22.00 to 22.50
Ohio Strong Softeners, No. 1	22.30 to 22.80
Ohio Strong Softeners, No. 2	21.80 to 22.30
Southern Coke, No. 1	20.90 to 21.40
Southern Coke, No. 2	20.40 to 20.90
Southern Coke, No. 3	19.90 to 20.40
Southern Coke, No. 4	19.40 to 19.90
Southern Coke, No. 1 Soft	20.90 to 21.40
Southern Coke, No. 2 Soft	20.40 to 20.90
Southern Gray Forge	17.90 to 18.40
Southern Mottled	17.65 to 18.15
Malleable Bessemer	21.30 to 21.80
Standard Bessemer	20.80 to 21.30
Jackson Co. and Kentucky Silvery, 6 %	23.30 to 23.80
Jackson Co. and Kentucky Silvery, 8 %	25.30 to 25.80
Jackson Co. and Kentucky Silvery, 10 %	27.30 to 27.80

Metals.—Sales of Copper in small lots have been reported on the basis of 23c., but the nominal minimum is about ½c. higher than this price. Speculative buying of Pig Tin continues, and prices are further advanced. We quote: Casting Copper, 23½c. to 24c.; Lake, 23½c. to 24c., in car lots; small lots, ¼c. to ⅜c. higher; Pig Tin, car lots, 45¼c.; small lots, 45¾c. to 46c.; Lead, Desilverized, 6.10c. to 6.20c., for 50-ton lots; Corroding, 6.80c. to 6.90c., for 50-ton lots; on car lots, 2¼c. per 100 lb. higher; Cookson's Antimony, 28½c., and other grades, 26½c. to 27½c.; Sheet Zinc is 7.75c. list, f.o.b. Lasalle, in car lots of 60-lb. casks. On Old Metals we quote: Copper Wire, 18¼c.; Heavy Copper, 18c.; Copper Bottoms, 17¼c.; Copper Clips, 17¼c.; Red Brass, 17¼c.; Red Brass Borings, 15¼c.; Yellow Brass, 13c.; Yellow Brass Borings, 11¾c.; Light Brass, 9¼c.; Lead Pipe, 5.40c.; Tea Lead, 5c.; Zinc, 5c.; Pewter, No. 1, 26c.; Tin Foil, 32c.; Block Tin Pipe, 27½c.

(By Mail.)

Billets and Rods.—Sales of Forging Billets aggregating 10,000 tons for delivery during the first half of next year have been made in this market the past week at prices ranging from $34 to $35. Several 500-ton lots for November-December shipment were sold on the basis of $36 to $37, and large consumers are again endeavoring to place their future requirements with the mills at prices somewhat lower than those now prevailing. An Eastern importer shortly expects a consignment of 13,000 tons of Steel which has been offered in this market for $35, but as yet remains unsold. Bessemer and Open Hearth Rods for early shipment are held at $36 to $37, Chicago, although the bulk of the tonnage closed earlier in the year is being shipped to the consumers at $35 for Open Hearth. With the completion of the Universal mill now under erection and the Light Rail mill the Illinois Steel Company will have balanced its Steel production and finishing capacity, although there is a possibility that at times when the demand for certain finished lines is not so heavy Billets will be available for the open market. No contracts for any specific tonnage will be made with consumers, however, the company reserving the right to ship only to the extent of its surplus.

Rails and Track Supplies.—There has been no heavy buying of Standard Section Rails in this market, although all of the trunk lines are placing contracts for their 1907 requirements of track materials, and the tonnage now on the books of the Illinois Steel Company pre-empts its output until nearly September. There has been no decline in the demand for Light Rails, notwithstanding the recent advance and the deferred deliveries. Quotations are as follows: Angle Bars, accompanying Rail orders, 1906 delivery, 1.50c.; carload lots, 1.75c.; Spikes, 2.27½c. to 2.50c., according to delivery; Track Bolts, 2.65c. to 2.75c., base, Square Nuts, and 2.80c. to 2.90c., base, Hexagon Nuts. The store prices on Track Supplies range from 0.15c. to 0.20c. above mill prices. Light Rails, 30 to 45 lb. sections, $30 to $31; 25-lb., $32; 20-lb., $32; 16-lb., $34; 12-lb., $35, f.o.b. mill. Standard Sections, $28, f.o.b. mill, full freight to destination.

Structural Material.—While Structural fitters are not in position to make deliveries in less than four to six months the mills are well up on their specifications, and can make shipment in from a week to ten days. The tremendous increase in producing capacity has brought about this situation, as the consumption has shown a remarkable increase thus far this year. One large car interest has purchased close to 10,000 tons of Shapes to cover car orders recently placed, while specifications from other interests on sliding scale contracts are heavier than at any time this year. The Chicago & Northwestern Railway Company has contracted for approximately 500 tons of bridges, while the Northern Electric Company of San Francisco has placed an order with the American Bridge Company for a number of small bridges aggregating 200 tons. One Western road is in the market for its bridge requirements for next year, which will range from 7000 to 10,000 tons. Material from store continues to move freely, and is unchanged at 2.05c. to 2.10c. Mill quotations are unchanged, as follows: Beams and Channels, 3 to 15 in., inclusive, 1.86½c.; Angles, 3 to 6 in., ¼-in. and heavier, 1.86½c.; larger than 6 in. on one or both legs, 1.96½c.; Beams, larger than 15 in., 1.96½c.; Zees, 3 in. and over, 1.86½c.; Tees, 3 in. and over, 1.91½c., in addition to the usual extras for cutting to extra lengths, punching, coping, bending and other shop work.

Plates.—Although the Western mills have heavy specifications before them on both Sheared and Universal Plates, occasional small lot orders are shipped out in from two to three weeks to meet the competition of Eastern manufacturers who are better situated with regard to making early deliveries. Contracts for eight lake boats have been placed with the American Shipbuilding Company by the Lackawanna Steamship Company. These boats will engage in the Ore trade for the Lackawanna Steel Company, but the steamboat line is in no way owned or controlled by that company. It is probable, however, that it will furnish the Steel required. Prices are as follows: Tank Plates, ¼-in. and heavier, wider than 6¼ and up to 100 in. wide, inclusive, car lots, Chicago, 1.76½c.; 3-16 in., 1.86½c.; Nos. 7 and 8 gauge, 1.91½c.; No. 9, 2.01½c.; Flange quality, in widths up to 100 in., 1.86½c., base, for ¼ in. and heavier, with the same advance for lighter weights; Sketch Plates, Tank quality, 1.86½c.; Flange quality, 1.96½c. Store prices on Plates are as follows: Tank Plate, ¼-in. and heavier, up to 72 in. wide, 2c. to 2.10c.; from 72 to 96 in. wide, 2.10c. to 2.20c.; 3-16 in., up to 60 in. wide, 2.10c. to 2.20c.; 72 in. wide, 2.35c. to 2.45c.; No. 8, up to 60 in. wide, 2.15c. to 2.25c.; Flange and Head quality, 0.25c. extra.

Sheets.—Concessions on some of the lighter gauges which were made by a few of the independent mills have been entirely withdrawn, inasmuch as the tonnage recently placed has provided practically all of the mills with work for the next 60 days. Black and Galvanized Sheets from store are held at premiums of $1 a ton above the prices prevailing below where spot shipment is desired. Quotations are unchanged, as follows: Blue Annealed, No. 10, 1.91½c.; No. 12, 1.96½c.; No. 14, 2.01½c.; No. 16, 2.11½c.; Box Annealed, Nos. 17 to 21, 2.41½c.; Nos. 22 to 24, 2.46½c.; Nos. 25 and 26, 2.51½c.; No. 27, 2.56½c.; No. 28, 2.66½c.; No. 29, 2.81½c.; No. 30, 2.91½c. Galvanized Sheets, Nos. 10 to 14, 2.61½c.; Nos. 15 and 16, 2.81½c.; Nos. 17 to 21, 2.96½c.; Nos. 22 to 24, 3.11½c.; Nos. 25 and 26, 3.31½c.; No. 27, 3.51½c.; No. 28, 3.71½c.; No. 30, 4.21½c. Sheets from store: Blue Annealed, No. 12, 2.15c. to 2.25c.; No. 14, 2.20c. to 2.30c.; No. 16, 2.30c. to 2.40c.; Box Annealed, Nos. 18 to 20, 2.60c. to 2.70c.; Nos. 22 to 24, 2.65c. to 2.75c.; No. 26, 2.70c. to 2.80c.; No. 28, 2.85c. to 2.95c.; No. 30, 3.25c. to 3.35c. Galvanized from store: Nos. 10 to 20, 3.10c. to 3.20c.; Nos. 22 to 24, 3.35c. to 3.45c.; Nos. 26, 3.45c. to 3.55c.; No. 27, 3.55c. to 3.75c.; No. 28, 3.85c. to 3.95c.; No. 30, 4.45c. to 4.55c.

Bars.—Western car interests are now placing heavy contracts for Iron Bars to cover car orders recently received. On much of this tonnage on which the specifications are severe premiums are being secured, although ordinary business in carload lots can still be placed with some of the mills on the basis of 1.50c., Pittsburgh, notwithstanding an advance of $2 a ton, which is being strictly maintained by the Republic Iron & Steel Company and some of the larger outside Iron mills. We quote as follows: Iron Bars, 1.71½c.; Steel Bars, 1.66½c. to 1.76½c., both half extras; Hoops, 2.06½c., extras as per Hoop card; Bands, 1.66½c., as per Steel card; Soft Steel Angles and Shapes, 1.66½c., half extras. Store prices are as follows: Bar Iron, 2.10c.; Steel Bars, 1.85c., and as high as 2c. is asked on certain scarce

sizes; Steel Bands, 1.85c. to 1.90c., half extras; Soft Steel Hoops, 2.30c. to 2.40c., full extras.

Merchant Pipe.—On Friday, October 12, the National Tube Company advanced Black and Galvanized Steel Pipe two points, equivalent to $4 a ton, while Casing was advanced one point, or $2 a ton. No official list has been issued by the National Tube Company on Iron Pipe, which is held at an advance of three points above Steel. We revise discounts, car lots, Chicago, as follows: Black Steel Pipe, 77.35, on the base sizes, ¾ to 6 in., and Galvanized, 67.35. From store in small lots Chicago jobbers quote 74½ to 75 per cent. on Black Steel Pipe, ¾ to 6 in.

Boiler Tubes.—The advance on Pipe has not affected prevailing prices on Boiler Tubing, as little new business in this line is being offered at present, the largest consumers and distributers having covered their requirements four months ago when the sharp reduction in prices was announced. Mill quotations are unchanged, as follows, on base sizes 2¾ to 5 in., in carload lots: Steel Tubes, 68.35; Iron, 55.35; Seamless, 50.35; 2½-in. and smaller and lengths over 18 ft., and 2½-in. and lengths over 22 ft., 10 per cent. extra. Store prices are unchanged, as follows:

	Steel.	Iron.	Seamless.
1 to 1½ in.	40	35	42½
1¾ to 2¼ in.	50	35	35
2½ in.	52½	35	30
2¾ to 3 in.	60	47½	42½
6 in. and larger	50	35	..

Merchant Steel.—Consumers are experiencing considerable difficulty in securing early deliveries of Cold Rolled Bands and Bars, none of the mills being in position to make shipment in less than three months. Contracts are being placed for next year's requirements, one large producer already having booked up its output through the first half of next year. There is no decline in the consumption of Agricultural Shapes, and the mills are unable to keep up with specifications of the implement makers. We quote: Planished or Smooth Finished Tire Steel, 1.86½c.; Iron Finish, up to 1½ x ½ in., 1.81½c.; Iron Finish, 1½ x ½ in. and larger, 1.66½c., base; Channels for solid rubber Tires, ¾ to 1 in., 2.16½c. and 1⅛-in. and larger, 2.06½c.; Smooth Finished Machinery Steel, 1.91½c.; Flat Sleigh Shoe, 1.71½c.; Concave and Convex Sleigh Shoe, 1.96½c.; Cutter Shoe, 2.35c.; Toe Calk Steel, 2.21½c.; Railway Spring, 1.86½c.; Crucible Tool Steel, 6½c. to 8c., and still higher prices are asked on special grades. Shafting, 50 per cent. off in car lots and 45 per cent. in less than car lots, in base territory.

Cast Iron Pipe.—Current demand is light, as the season for laying Pipe is nearing its close. We make the following quotations: Water Pipe, 4-in., $34; 6, 8, 10 and 12 in., $33; over 12-in., $32, with $1 extra for Gas Pipe.

Coke.—Contracts for Furnace Coke for 1907 delivery are now being closed with Connellsville producers on the basis of $3 at the ovens. By-product Coke for furnace operations is held at $5.35 to $5.50, and owing to the heavy demands of the foundry trade little is available at these prices. By-product Foundry Coke for nearby delivery has been advanced to $6.40, f.o.b. Chicago, while Connellsville 72-hr. Coke is quoted at $5.15 to $5.40, and Virginia $5.75 to $6.

Old Material.—There is a pronounced scarcity of second-hand Rails in rerolling lengths and quotations have been advanced $1 in the past few days. In the East there has been heavy buying, not only of this material, but Frog, Switch and Guard Rails as well, and this has greatly strengthened the local market. The demand for Cast Scrap has also increased on account of the delayed deliveries of Pig Iron and quotations have advanced to $16.50. The general tendency of the Old Material market is upward, and the railroads are experiencing no difficulty in disposing of their material at the prices given below. Quotations on gross tons, car lots, f.o.b. Chicago, are as follows:

Old Iron Rails	$26.00 to $26.50
Old Steel Rails, 4 ft. and over	19.00 to 19.50
Old Steel Rails, less than 4 ft.	18.00 to 18.50
Heavy Relaying Rails, subject to inspection, 50 lb. and under	28.50 to 29.00
Old Car Wheels	19.25 to 19.75
Heavy Melting Steel Scrap	16.50 to 17.00
Frogs, Switches and Guards	17.00 to 17.25
Mixed Steel	14.00 to 14.50

The following quotations are per net ton:

Iron Fish Plates	$20.00 to $20.50
Iron Car Axles	25.00 to 25.50
Steel Car Axles	20.50 to 21.00
No. 1 Railroad Wrought	17.50 to 18.00
No. 2 Railroad Wrought	16.50 to 17.00
Railway Springs	15.50 to 16.00
Locomotive Tires, smooth	16.00 to 16.50
No. 1 Dealers' Forge	13.50 to 14.00
Mixed Bushelling	11.50 to 12.00
Iron Axle Turnings	10.50 to 11.00
Soft Steel Axle Turnings	10.50 to 11.00
Machine Shop Turnings	10.50 to 11.00
Cast Borings	8.50 to 9.00
Mixed Borings, &c.	8.50 to 9.00
No. 1 Mill	10.00 to 10.50
No. 2 Mill	9.00 to 9.50
No. 1 Boilers, cut to Sheets and Rings	11.50 to 12.00
No. 1 Cast Scrap	16.00 to 16.50
Stove Plate and Light Cast Scrap	13.00 to 13.50
Railroad Malleable	15.00 to 15.50
Agricultural Malleable	14.50 to 15.00

Philadelphia.

REAL ESTATE TRUST BUILDING, October 16, 1906.

The undertone of strength in the Iron and Steel trades shows no impairment, although the increase in the production of Pig Iron is suggestive of easier conditions. With an increase in supply at the rate shown in the furnace report in last week's issue of *The Iron Age* it would not be surprising to see less urgency in the demand, but so far there is no let up whatever. Still, if the furnaces continue to increase their output in the same ratio as during last month, and it is expected that they will, it will be strange indeed if it does not check the demand and cause some little reaction in prices. It has not done so yet, however, and the average of prices the past week has been higher than at any time since January, 1903. There are many reasons for the present high prices, such, for instance, as the scarcity and the high cost of labor and material; but when the supply reaches a point at which there is little more than enough to go around prices soon begin to waver, and eventually to suffer more or less of a decline. There is no way to check an advance when there is a scarcity; neither is there any way to check a decline when there is a surplus. It is all very well to say that the high cost will prevent a decline, and it will to a certain extent, but if the supply is larger than the demand cost must be adjusted to meet the changed conditions or the supply curtailed in proportion to the demand.

Pig Iron.—There is no denying the fact that the average of prices is higher to-day than at any time since January, 1903, and that the demand, in proportion to the supply, is as large as it has ever been. In other words, there are ready buyers at full prices for anything that may be offered, while as a matter of fact nothing is offered until buyers ask for quotations. This is an altogether unprecedented condition of affairs, considering that the buying movement which began in July has continued without a break until the present time. It is easy to understand why the market should be strong for deliveries during 1906, but that they are relatively as strong for the first half of 1907 is surprising. Of course the anticipated further increases in production may not be realized, but if they are it will be the greatest marvel of all if prices can be maintained at their present level. Nevertheless there is not a weak spot in sight, and as far as surface indications go everything is on a rising scale, and until there is some evidence of a reaction the trade will continue to be optimistic, as well it may be, although it will do no harm to keep a close watch on the trend of events the next few weeks. It is almost impossible to give close quotations, varying as they do according to a variety of circumstances. New Irons can be had at $21 to $21.50 for No. 2 X Foundry, first half of 1907; while standard brands are quoted at $21.75 to $22.50 for such delivery. The same Irons for 1906 deliveries would probably command a premium of 50c. to $1 per ton. No. 3 Foundry and Gray Forge are in very active demand and are held at $18.75 to $19.25, according to delivery. Low Phosphorus commands $25.50 to $26, delivered, mostly foreign Iron, with sales of good sized lots at about $25, free on cars Atlantic seaboard. Basic has taken another upward movement and is now quoted at $19.50 to $19.75. There is a good inquiry and some rather important business has been placed at the inside figure, but one large consumer has just closed for a round lot for first half delivery at $19.65. The general range, however, for 1907 deliveries in this district would be about as follows:

No. 1 X Foundry	$23.00 to $23.50
No. 2 X Foundry	21.00 to 22.50
No. 2 Plain	21.00 to 21.50
Standard Gray Forge	18.50 to 19.25
Ordinary Gray Forge	18.00 to 18.50
Basic	19.50 to 19.75
Low Phosphorus	25.50 to 26.00
Malleable	21.00 to 21.50

Steel Alloys.—There is more business than for some time past, but prices are irregular and appear to be rather weak. Some Russian and some German Ferro are offered at low prices, but English commands about $80 to $82 spot; but for 1907 shipments asking prices vary from $74 to $76. Ferrosilicon is held at $100 to $105 spot and 11 per cent. about $33.

Steel.—It is difficult to get quotations for Steel, as the mills are so closely sold up that they have nothing to offer for reasonably early delivery, and they are not inclined to quote for 1907 except to regular customers, and even then for limited quantities. Nominally prices are about $33 to $34 for ordinary Billets, and $36 to $40 for Forging Billets.

Plates.—The demand for Plates is of the best character possible. The buying is so evenly distributed that it is difficult to point out any preponderating influence. The boiler trade is generally regarded as giving the keynote, as when it is busy all others are enjoying great prosperity; but there are no laggards at present, and prospects for an indefinite period are unusually bright. Prices are strong but unchanged, as follows:

	Carload. Cents.	Part carload. Cents.
Tank, Bridge and Boat Steel	1.73½	1.78½
Flange or Boiler Steel	1.83½	1.88½
Marine	2.13½	2.18½
Locomotive Firebox Steel	2.23½	2.28½

The above are base prices for ¼-in. and heavier. The following extras apply:

	Extra per 100 pounds.
3-16 in. thick	$0.10
Nos. 7 and 8, B. W. G.	.15
No 9, B. W. G.	.25
Plates over 100 to 110 in.	.05
Plates over 110 to 115 in.	.10
Plates over 115 to 120 in.	.15
Plates over 120 to 125 in.	.25
Plates over 125 to 130 in.	.50
Plates over 130 in.	1.00

Structural Material.—Plenty of business is going at unchanged prices, but deliveries can be secured more promptly than in almost any other department. Beams, Channels and Angles are quoted at 1.83½c. to 2c., according to specification and tonnage required.

Bars.—The demand for Bars is well maintained, and prices are firm at 1.83½c. to 1.88½c. for best Refined Iron. Steel Bars, because of the difference in prices, are relatively more active than Refined Iron, but it is hard to get deliveries, so that as a matter of fact prices are about on a parity if deliveries are to be made promptly.

Sheets.—The demand is excellent, but manufacturers complain that prices are out of proportion with the rest of the market. Prices, however, are unchanged and quoted as follows for mill shipments in carload lots, and a tenth additional for smaller quantities: Nos. 18 to 20, 2.50c.; Nos. 22 to 24, 2.60c.; Nos. 25 and 26, 2.70c.; No. 27, 2.80c., and No. 28, 2.90c.

Old Material.—Prices are not what may be called weak, but they are inclined to shade off a little, many consumers having reduced their bids. Bids and offers for deliveries in buyers' yards are about as follows:

Steel Crops	$18.50 to $18.75
No. 1 Steel Scrap	18.00 to 18.50
Low Phosphorus Scrap	22.50 to 23.00
Old Steel Axles	23.00 to 24.00
Old Iron Axles	31.00 to 31.50
Old Iron Rails	25.50 to 26.50
Old Car Wheels	20.75 to 21.25
Choice Scrap, R. R. No. 1 Wrought	22.00 to 22.50
Choice No. 1 Yard Scrap	19.00 to 20.00
Long and Short	18.50 to 18.75
Machinery Scrap	18.50 to 19.00
Wrought Iron Pipe	16.25 to 16.75
No. 1 Forge Fire Scrap	15.50 to 16.50
No. 2 Light Ordinary	11.50 to 12.00
Wrought Turnings	14.25 to 14.75
Axle Turnings, Choice Heavy	15.25 to 15.75
Stove Plate	13.50 to 14.00
Cast Borings	11.25 to 11.50
Grate Bars	13.50 to 14.00

Birmingham.

BIRMINGHAM, ALA., October 14, 1906.

Pig Iron.—Business the past week has been limited to small lots, but regardless of the dullness of the market producers have advanced the price 50c. per ton and are now quoting uniformly $16 for No. 2 Soft for delivery during first quarter of 1907. Buyers, however, who wish to contract for requirements for first half might secure some concession from this price, as most of the producers are quoting 50c. per ton lower on second quarter's business. Carload lots of No. 2 Soft for immediate delivery are readily bringing from $17.50 to $18. One or two of the smaller interests have withdrawn from the market for the time being, giving as a reason that their sales for next year's delivery are sufficient to assure them of a steady business for several months, and preferring to take chances on disposing of their unsold production next year at an advance rather than contracting it at present prices. Foundries in this district which have heretofore thought it impossible to produce satisfactory castings except with their favorite brands and grades of Iron are learning that others can be substituted and just as good results obtained, and in many mixtures Nos. 3 and 4 have been substituted for Nos. 1 and 2. The furnace of the Southern Steel Company at Trussville is to be started to-day after a suspension of several months, during which time it has been thoroughly repaired and relined. It was expected that this stack would go in blast several days since, but recent storms prevented a sufficient quantity of raw material being assembled to warrant an earlier starting. It will be blown in on Foundry Iron, but will probably be changed to Basic early next year, as when the additional Open Hearth furnaces which this company is now erecting at Gadsden are completed more Basic Iron will be required than can be supplied by its Gadsden stack. The stack of the Republic Iron & Steel Company at Thomas, which has been undergoing repairs for some months, is understood to be ready for blast, but owing to a shortage of Ore will not be blown in just yet.

Cast Iron Pipe.—The business being booked at present is principally from small towns which only require 100 tons or so each, but in the aggregate it amounts to almost as much as the production of the foundries. Shortage of cars is seriously affecting shipments of Water Pipe, as all gondola cars, in which large sizes are shipped, are being pressed into service for domestic Coal. This also applies to cars of every kind for shipment to Pacific Coast points, as owing to the blocked condition of the roads there and the length of time required to return cars local roads absolutely refuse to permit their cars to be used for this business. This is particularly a hardship on the manufacturers of Soil Pipe, as in the rebuilding of San Francisco thousands of tons will be used. As the foundries here have just begun making deliveries strenuous protests are being entered against the stand taken by the railroads. We revise quotations on Water Pipe for delivery next year as follows: 4 to 6 in., $31; 8 to 12 in., $30; over 12 in., $27.50, with $1 per ton extra for Gas Pipe.

Old Material.—The Scrap market is more active than for months, with every indication that it will remain so for some time. The demand for Cast from foundries which find it more economical at the present price than Pig Iron is so great that dealers are unable to furnish anything like the quantity desired. Dealers' quotations are approximately as follows per gross ton, f.o.b. cars here:

Old Iron Rails	$19.50 to $20.00
Old Iron Axles	18.50 to 19.00
Old Steel Axles	16.00 to 17.00
Old Car Wheels	16.50 to 17.50
No. 1 Railroad Wrought	16.50 to 17.00
No. 2 Railroad Wrought	14.50 to 15.00
No. 1 Country Wrought	14.50 to 15.00
No. 2 Country Wrought	11.50 to 12.00
Wrought Pipe and Flues	11.50 to 12.00
Railroad Malleable	13.00 to 13.50
No. 1 Steel	13.00 to 13.50
No. 1 Machinery Cast	14.00 to 14.50
Stove Plate and Light Cast	10.00 to 10.25
Cast Borings	7.00 to 7.50

Cleveland.

CLEVELAND, OHIO, October 17, 1906.

Iron Ore.—The good demand for all grades continues, with premiums paid for the higher grades. No sales for 1907 shipment have been made, although many consumers have been assured that they are not going to be overlooked in the distribution of Ores next season, even though their consumption will be larger than in past years. Transportation conditions, however, have changed materially and indications are that there is a more radical change just ahead. The demand for boats in other lines of trade has increased, causing shippers of Ore to advance wild rates to 80c. from Duluth to Buffalo. A commensurately higher rate is being paid from Marquette and Escanaba. Grain rates now being paid from the head of the lakes are on the basis of $1.12 on Ore and further advances in the wild Ore rate are not unlikely, especially in view of the fact that many of the shippers are anxious to get as much down as possible before colder weather sets in. Another change made in transportation conditions is the purchase during the week of eight boats by the Lackawanna Steamship Company, supposed generally to be affiliated with the Lackawanna Steel Company. This new interest works through Pickands, Mather & Co., Cleveland, and thereby gets in touch with a supply of Ore, nearly sufficient for its needs. It marks the entry of another Steel making concern into the ownership of boats. Coupled with the big purchases recently made by the Pittsburgh Steamship Company for the Steel Corporation; with the recent purchase of W. H. Becker for the Jones & Laughlin Steel Company, one more order having been placed Saturday for the same account, and with the purchases of the Cleveland Cliffs Iron Company of several boats, this seems to increase the tendency for Steel makers to own their own boats, thus pushing the individual vessel owner aside, abolishing the strictly merchant fleet.

Pig Iron.—The shortage of Foundry Iron is growing more acute, and prices have risen to a point where many of the furnace interests believe there is danger. Iron for quick shipment is especially hard to obtain, and in addition some of the leading makers have retired from the market for first half delivery. They announce that the larger percentage of their regular customers has already covered for that delivery, but that those uncovered will have to look out for themselves. In this territory spot Iron is being sold at $22.25, delivered in Cleveland, for No. 2 Foundry, while some sales have been made during the week at $22.50 at the furnace, bringing the delivered price to $23.25. Such high prices, however, are the exception and indicate the need for Iron of some sort on very quick shipment. The furnaces which have retired from the market for first half delivery did so after selling some No. 2 at $19.50, Valley furnace, for second quarter delivery and $20 for first quarter delivery. The furnaces having any Iron to sell are taking orders at $19.50 through the first half, although some sales have been made on the basis of $20 for the same delivery. Southern producers are also quoting higher prices in this market. For the first half most of the furnaces are selling at $16, Birmingham, for No. 2, although some higher prices

have been paid. Southern No. 2 for spot shipment has been sold at $18, Birmingham, although generally the price rules about $17.50, Birmingham, with the supply for this territory extremely limited. To this is added a freight rate of $4.10 to make up the Cleveland price. Bessemer producers in some instances are selling at $19.25 to $19.50 for first half delivery, although only small lots have been sold at these higher prices. Basic is quoted at $19 to $19.25.

Coke.—Buyers are covering their needs for the entire year at $3 at oven for Furnace and $3.75 at oven for 72-hour Foundry Coke.

Finished Iron and Steel.—The rise in Pipe prices decided upon recently has not checked the buying of all grades through this market. The demand has been so strong that there has been little disposition to quibble about prices. Sheets are also exceptionally strong and the mills are apparently getting further behind than ever with their deliveries. So far prices have not been disturbed, although it is expected that another advance will be forced by the action of the smaller mills. The latter are having considerable difficulty in getting Steel, but so far it has not caused any interruption of production. Sheet prices out of stock are still based on 2.15c. for No. 10 Blue Annealed, 2.80c. for No. 28 One Pass Cold Rolled and 3.80c. for No. 28 Galvanized. Just prior to the annual meeting of the American Shipbuilding Company last week the announcement was made by the management that the Lackawanna Steamship Company had placed an order for eight new Steel steamers, three of which are to carry 7000 tons and five are to carry 8000 tons. They will be managed by Pickands, Mather & Co., Cleveland, producers of Ore and Pig Iron and shippers of considerable quantities of Ore on the lakes. The new boats are to be delivered late next year and the whole fleet will be in commission by the opening of navigation in 1908. It is reported that the same interest contemplates the purchase of eight more steamers in the near future, giving a substantial fleet for lake operations. This will complete the list of steamship companies controlled by big Steel making concerns. The demand for Structural Shapes is strong, other lines being quite as active, as the boat business would indicate. In some instances smaller consumers are patronizing Eastern mills, paying a slight premium. Plates are also strong, but with the mills keeping shipments closer to orders. The Billet market is strong, with the supply still short. Forging Billets are selling at $35 to $36 at mill, while Rolling Billets are selling around $29 to $30 at mill.

Old Material.—With the price of Pig Iron going steadily upward the mills are not meeting with much success in getting the price of Scrap reduced. The market is steady, with fairly good buying and prices strong, but practically unchanged. The following are dealers' prices to the trade, f.o.b. Cleveland, per gross ton: Old Steel Rails, $17 to $18; Old Iron Rails, $25 to $26; Iron Car Axles, $20 to $21; Heavy Melting Steel, $17 to $18. Per net ton: Cast Borings, $9 to $10; No. 1 Busheling, $15 to $15.50; No. 1 Railroad Wrought, $17 to $18; No. 1 Cast, $16; Iron and Steel Turnings and Drillings, $11 to $12.

Cincinnati.

FIFTH AND MAIN STS., October 17, 1906.—(*By Telegraph.*)

Pig Iron.—An increased demand is observed for second quarter delivery of next year, with spot Iron scarce and difficult to obtain. This condition will probably continue and may run into first quarter's delivery. The dividing line between what constitutes near and forward delivery is gradually being extended as the year advances and the schedule is being raised accordingly. The situation is daily becoming more strained and spot shipments are more restricted. Reports indicate that prices for January are virtually the same as for the balance of this year, namely, $17 to $17.50, Birmingham, with furnaces generally holding at $15 to $16 for the first six months, with the bulk of the business going at $16. The furnace output continues to be greatly restricted on account of labor troubles, scarcity of cars and irregular Ore and Coke shipments. Gray Forge is in moderate demand, with the available supply quite limited. Steelmaking Irons are perhaps more scarce than Foundry grades, with the demand strong. There is practically no change in the situation as regards Northern furnaces and offerings are exceedingly limited so far as prompt deliveries are concerned. Quotations have considerable latitude, with $21 at furnace for this year and $19 to $19.50 for next year fairly well established. A sale of 1000 tons of Valley Basic is reported at $20.50, Valley furnace, for prompt shipment. Several large consumers are in the market for considerable tonnage both for this year and next. One concern in Southern Ohio wants 1500 tons of Northern Malleable for shipment covering May and June. To sum it all up in a single sentence the situation daily grows stronger, as the supply of Iron available for prompt shipment diminishes. Freight rates from Hanging Rock District to Cincinnati are $1.15, and from Birmingham $3. We quote, f.o.b. Cincinnati, as follows:

Southern Coke, No. 1	$20.50 to $21.00
Southern Coke, No. 2	20.00 to 20.50
Southern Coke, No. 3	19.50 to 20.00
Southern Coke, No. 4	18.50 to 19.50
Southern Coke, No. 1 Soft	20.50 to 21.00
Southern Coke, No. 2 Soft	20.00 to 20.50
Southern Coke, Gray Forge	17.25 to 17.75
Southern Coke, Mottled	16.75 to 17.00
Ohio Silvery, 8 per cent	25.15
Lake Superior Coke, No. 1	23.15
Lake Superior Coke, No. 2	22.65
Lake Superior Coke, No. 3	22.15

Car Wheel Irons.

Standard Southern Car Wheel	$26.00 to $26.50
Lake Superior Car Wheel	25.00 to 25.50

Coke.—This market continues strong, most of the demand to-day, however, being for calls on contracts. Prices are very firm, the best brands of Virginia and Connellsville Foundry being quotable at $3.85 to $4 for this year's delivery and $3.65 to $3.75 for next.

Finished Iron and Steel.—The tonnage sold into next year is quite heavy and the market is strong. Quotations are not being made beyond July 1, the mills being well covered until then. Light Rails are in fair demand, with Standard Sections practically sold up for the first six months. Universal Plates are scarce, with Sheared Plates more readily obtainable. The average delivery on Steel Bars is about 90 days and on Rivets about 30 days. Spikes and other Track Supplies are well sold up for the balance of the year. The present market on Structural Rivets is $2,20 and on Boiler Rivets $2.35, f.o.b. Pittsburgh. We quote, f.o.b. Cincinnati, as follows: Iron Bars, in carload lots, 1.73c., with half extras; the same, in smaller lots, 2c., with full extras; Steel Bars, in carload lots, 1.63c., with half extras; the same, in smaller lots, 1.85c., with full extras; Base Angles, 1.83c., in carload lots; Beams and Channels, in carload lots, 1.83c.; Plates, ¼-in. and heavier, 1.73c., in carload lots; in smaller lots, 1.90c.; Sheets, 16 gauge, in carload lots, 2.15c.; in smaller lots, 2.70c.; 14 gauge, in carload lots, 2.05c.; in small lots, 2.60c.; Steel Tire, 1 x ¼ in. or heavier, 1.83c., in carload lots.

Old Material.—The demand for Scrap is extremely strong and prices are firm. The foundries are heavy buyers of Car Wheels, Stove Plate and other Cast Scrap owing to the Pig Iron situation. We quote dealers' prices, f.o.b. Cincinnati, about as follows: No. 1 Railroad Wrought, $17 to $18, net ton; Cast Borings, $8 to $9, net ton; Steel Turnings, $10 to $11, net ton; No. 1 Cast Scrap, $15 to $16, net ton; Iron Rails, $23.50, gross ton; Steel Rails, rolling mill lengths, $16 to $17, gross ton; Relaying Rails, 56-lb. and upward, $27 to $28, gross ton; Iron Axles, $25 to $26, net ton; Car Wheels, $17 to $18, gross ton; Low Phosphorus, $18 to $19, gross ton.

Pittsburgh.

PARK BUILDING, October 17, 1906.—(*By Telegraph.*)

Pig Iron.—The Pig Iron market is quiet as far as tonnage being sold is concerned, but prices are higher. On October 1 96 per cent. of the blast furnaces using Lake Superior Ores were in blast, against 90 per cent. on September 1. Some Valley furnaces that were idle for repairs have gone in and the output of Pig Iron in October promises to be much heavier than in September. With cold weather coming, the output of the blast furnaces will be materially increased, and by December 1 the present shortage in supply of Pig Iron ought to be relieved to some extent. During the week a local consumer bought 3000 to 4000 tons of Basic Iron at prices ranging from $18.65 to $19, Valley furnace. The market to-day on Basic is firm at $19 to $19.25, and possibly higher prices would be paid for September shipment. Malleable Bessemer and Standard Bessemer have sold as high as $20, Valley furnace, and we note a sale of 1500 tons of Malleable for delivery in the first quarter of next year at $20, Valley furnace. The market on Standard Bessemer may be fairly quoted at $19.50 to $20, but there is so little Iron offering that it is difficult to make an exact statement. Northern No. 2 Foundry continues to sell for the balance of this year's delivery and into the first quarter of next year at $20.50 to $21, Valley furnace, but there are reports of sales of small lots of Foundry for prompt shipment as high as $22 at furnace. A local consumer of Forge Iron has bought in the past two or three weeks from 8000 to 10,000 tons, paying as high as $18.50, Valley furnace, for late purchases.

Coke.—We note a sale of 60 cars of Connellsville Furnace Coke for prompt shipment at $2.75 at oven. It is reported, but not officially confirmed, that the Frick Coke Company has bought the entire output of five or six independent Coke works in the Connellsville region for all of next year.

Steel.—There is no increase in the supply of Steel, and higher prices are being paid for Billets and Sheet Tin Bars for prompt delivery. We quote Bessemer Billets at $28 to $29, and Open Hearth $30 to $31, maker's mill. We note a sale of 600 tons of small Open Hearth Billets at 31.

(By Mail.)

Present conditions in the Iron trade are unprecedented, and where the market on Pig Iron and Steel is going to stop is a good deal of a question. During the week Bessemer and Basic Iron has sold for prompt shipment at $21, Pittsburgh, and there are reports that even higher prices are being paid for little lots of spot Iron. The market on Pig Iron and Steel is practically in the shape that it is not a question of price but of getting the material. Furnaces are bare of Iron and the same is true of consumers' yards, and it looks as though still higher prices are to come. Deliveries on Steel Billets, Sheet and Tin Bars are getting worse, and there is much complaint from consumers. Bessemer Billets readily bring $29, Pittsburgh, and small Open Hearth Billets have sold at $31. In Finished Iron and Steel the event of the week is the advance of $4 a ton in Merchant Pipe announced by the National Tube Company and effective from October 12. This advance has been expected by the trade for some time. The next articles that will be advanced in price are Sheets and Tin Plate, and the announcement of higher prices by the American Sheet & Tin Plate Company is looked for. If the market can only be held in check to some extent, it looks as though present conditions are likely to last through the first half of next year at least.

Ferromanganese.—There is some inquiry for Ferro for spot shipment and prices are firm. We quote 80 per cent. Ferro for prompt shipment at $80 to $83, while $75 to $77.50 is asked for delivery over the next three or four months.

Wire Rods.—The market on Rods is firm, and they are very scarce for prompt shipment. We continue to quote Bessemer Rods at $34.50 to $35, Pittsburgh, while Chain Rods from Bessemer stock are held at $33 to $34, Pittsburgh. Open Hearth Rods can hardly be had at any price, but we quote these nominally at $35 to $36, Pittsburgh.

Muck Bar.—A fair inquiry is found for Muck Bar, and, like all other raw materials it is scarce for prompt delivery. We quote best grades, made from all Pig Iron, at $32.50 to $33, Pittsburgh; from part Scrap, $30.50 to $31, Pittsburgh.

Skelp.—The market is quiet as far as new sales go, but buyers are specifying freely on contracts. Prices are very firm and we quote: Grooved Steel Skelp, 1.57½c. to 1.65c.; Sheared Steel Skelp, 1.60c. to 1.70c.; Grooved Iron Skelp, 1.65c. to 1.75c.; Sheared Iron Skelp, 1.80c. to 1.85c., Pittsburgh, these prices depending on widths and gauges.

Steel Rails.—No large tonnage in Standard Sections was placed during the week. The demand for Light Rails is very active and the market is firm. We quote Light Rails as follows: 20 to 45 lb. sections, $31; 16-lb. sections, $32, and 12-lb. sections, $33, at mill. Standard sections are $28 at mill, and it is stated that the mills have already booked about 2,000,000 tons for next year's delivery.

Structural Material.—No large local contracts were placed during the week, but a good deal of work is in sight. About 1200 tons of Steel will be required for the new buildings of the La Belle Iron Works at Steubenville, Ohio, and bids on this work went in last night. Two other large local jobs are about ready to be figured on, and the American Bridge Company has taken the Steel for the new buildings for the cement plant of the Universal Portland Cement Company. A good deal of small work is being placed, and all the Structural interests are crowded with tonnage. Prices are very strong, but there are no indications of any advance, and it is not expected that official prices will be changed. We quote: Beams and Channels, up to 15-in., 1.70c.; over 15-in., 1.80c.; Angles, 3 x 2 x ¼ in. thick up to 6 x 6 in., 1.70c.; 8 x 8 and 7 x 3½ in., 1.80c.; Zees, 3-in. and larger, 1.70c.; Tees, 3-in. and larger, 1.75c. Under the Steel Bar card Angles, Channels and Tees under 3-in. are 1.60c., base, for Bessemer and Open Hearth, subject to half extras on the Standard Steel Bar card.

Plates.—It is understood that an order for 5000 tons of Sheared Plates for the extension to the water works system of Buffalo, N. Y., has been placed with a local mill. Some very heavy tonnage is in sight, and the Plate mills, while they are getting out a heavy tonnage, are unable to catch up on deliveries, on which they are from four to six weeks behind. The Steel car builders are taking an enormous tonnage and are crowded with orders for cars well into next year, so that the heavy demand from this source will last for some months yet. The Plate mills are assured of all the work they can handle into summer of next year. The market is firm and we quote: Tank Plates, ¼ in. thick, 6¼ in. up to 100 in. in width, 1.60c., base, at mills, Pittsburgh. Extras over this price are as follows:

	Extra per 100 lb.
Gauges lighter than ¼-in. to and including 3-16-in. Plates on thin edge	$0.10
Gauges Nos. 7 and 8	.15
Gauge No. 9	.25
Plates over 100 to 110 in	.05
Plates over 110 to 115 in	.10
Plates over 115 to 120 in	.15
Plates over 120 to 125 in	.25
Plates over 125 to 130 in	.50
Plates over 130 in	1.00
All sketches (excepting straight taper Plates varying not more than 4 in. in width at ends, narrowest end being not less than 30 in.)	.10
Complete Circles	.20
Boiler and Flange Steel Plates	.10
"A. B. M. A." and ordinary Firebox Steel Plates	.20
Still Bottom Steel	.30
Marine Steel	.40

Shell Grade of Steel is abandoned.

TERMS.—Net cash 30 days. For anticipated payments a maximum discount may be allowed at the rate of 6 per cent. per annum and for a longer time than 30 days interest shall be charged at the same rate per annum. Invoices paid within 10 days from date thereof, discount of ½ of 1 per cent. is allowable. Pacific Coast base, 1.60c., f.o.b. Pittsburgh, with all rail tariff rate of freight to destination added, no reduction for rectangular shapes 14 in. wide down to 6 in. of Tank, Ship or Bridge quality.

Sheets.—New business in both Black and Galvanized Sheets continues heavy, and none of the mills are in position to make deliveries inside of three to four weeks or longer. The supply of Steel is no better, but on the contrary seems to be getting worse. Prices are very firm but unchanged and we quote: Nos. 17 to 21, 2.25c.; Nos. 22 to 24, 2.30c.; Nos. 25 and 26, 2.35c.; No. 27, 2.40c.; No. 28, 2.50c.; No. 29, 2.65c., and No. 30, 2.75c. We quote Galvanized Sheets as follows: Nos. 10 and 11, 2.45c.; Nos. 12 and 14, 2.55c.; Nos. 15 and 16, 2.55c.; Nos. 17 to 21, 2.80c.; Nos. 22 and 24, 2.95c.; Nos. 25 and 26, 3.15c.; No. 27, 3.35c.; No. 28, 3.55c.; No. 29, 3.80c., and No. 30, 4.05c. We quote No. 28 Gauge Painted Roofing Sheets at $1.75 per square, and Galvanized Roofing Sheets, No. 28 gauge, $3.10 per square for 2-in. corrugations. These prices are for carload lots, jobbers charging the usual advances for small lots from store.

Iron and Steel Bars.—New business in both Iron and Steel Bars aggregates a heavy tonnage and specifications on contracts are being received in good volume, with the result that the Bar mills are crowded with work and are from four to six weeks or longer behind in deliveries. The market is very firm and on Steel Bars for prompt shipment 1.60c., Pittsburgh, is readily paid. We quote Steel Bars at 1.50c. for indefinite delivery, and 1.60c., base, half extras, for delivery in three to four weeks. Iron Bars are held at 1.60c. minimum, with premiums of $1 to $2 a ton being paid for reasonably prompt shipment.

Hoops and Bands.—We can report a considerable increase in new tonnage, the mills entering more orders in the past two or three weeks than for some time. Consumers are specifying freely on contracts and prices are firm. We quote: Steel Hoops, 1.90c., and Bands for all purposes at 1.50c., base, half extras, as per Standard Steel card. These prices are for carload lots, f.o.b. Pittsburgh, plus full tariff rail rate to point of delivery, an advance of $2 a ton being charged for less than carloads.

Tin Plate.—The recent advance of $1 a ton in Wire products and the advance this week of $4 a ton in Pipe are expected by the trade to be followed with an advance in Tin Plate. The demand for Tin Plate in August and September was enormously heavy, the mills entering large contracts for delivery into the first quarter of next year, and in some cases through the second quarter, prices for second quarter delivery being 15c. per base box higher than for deliveries running into March. The supply of Tin Bars is no better and prices are higher, and with Tin around 42c. it would seem that all conditions favor an advance in prices of Tin Plate. Some of the independent mills advise us they are getting premiums of 10c. to 15c. a box on Tin Plate for reasonably prompt delivery. We quote $3.75 per base box, f.o.b. Pittsburgh, for 14 x 20 100-lb. Cokes, terms 30 days, less 2 per cent. off for cash in 10 days, on which price a rebate of 5c. a box is allowed for carload and larger lots.

Railroad Spikes.—The demand does not show any falling off, and leading makers are filled up for this year, and have a great deal of tonnage entered for delivery into first quarter of next year. We quote Railroad Spikes at $2.50 to $2.60 for indefinite delivery, and about $2.75 for delivery in four to six weeks. Two local concerns that are large makers of Spikes advise us that they are turning down orders almost every day, being unable to make deliveries wanted.

Spelter.—Prices have gone off again, and the demand is quiet. We quote prime grades of Western Spelter at 6c., St. Louis, equal to 6.12½c., Pittsburgh.

Merchant Pipe.—The long expected advance in prices of Merchant Pipe has been made, the National Tube Company announcing an advance of two points, or $4 a ton, effective October 12. This advance has also been made by the outside mills and the market is firm at the higher prices. No change was made in Iron Pipe, but a new list from the mills that roll Iron Pipe is expected in a few days. The Pure Oil Company is understood to have placed an order for about 285 miles of 6-in. Line Pipe to carry oil from Pine Grove, W. Va., to Marcus Hook, near Philadelphia. This is the largest order for Line Pipe placed in this market for some months. The extreme discount on Merchant sizes of Steel Pipe is now 79 and 5 per cent. off, to the large trade. The new official discounts which became effective on October

12, but which are shaded one point or more to the large trade, are as follows:

Merchant Pipe.

	Jobbers, carloads.			
	Steel.		Iron.	
	Black.	Galv.	Black.	Galv.
	%	%	%	%
⅛ and ¼ in.	70	54	69	53
⅜ in.	72	58	71	57
½ in.	74	62	73	61
¾ to 6 in.	78	68	77½	67½
7 to 12 in.	73	58	72½	57
Extra strong, plain ends:				
⅛ to ⅜ in.	63	51	62	50
½ to 4 in.	70	58	69	57
4½ to 8 in.	66	54	65	53
Double extra strong, plain ends:				
½ to 8 in.	59	48	58	47

Boiler Tubes.—No change has been made in Boiler Tubes, but the market is firm, and the large trade is asking prices on heavy contracts for delivery through first quarter and first half of next year. It would not be surprising if prices on Tubes were advanced before long, as they are very low in comparison with prices of Steel and Skelp. Official discounts on carload lots, which are now pretty well held, are as follows:

Boiler Tubes.

	Iron.	Steel.
1 to 1½ in.	45	50
1¾ to 2¼ in.	45	62
2½ in.	50	64
2¾ to 5 in.	57	70
6 to 13 in.	45	62

Iron and Steel Scrap.—There is no improvement in the demand for Scrap and prices are a shade easier. Dealers who have stocks of Scrap are firm in their ideas as to prices and are not willing to shade quotations in order to get business, believing the market will be better later on. Prices quoted by dealers are about as follows, per gross ton, f.o.b. Pittsburgh: Heavy Steel Melting Scrap, $16.75 to $17; No. 1 Wrought Scrap, $19.25 to $19.50; Old Steel Rails, short pieces for Open Hearth use, $16.75 to $17; Old Steel Rails, rerollers, $18.75 to $19; Bundled Sheet Scrap, $15.50 to $15.75; Cast Iron Borings, $10.25 to $10.50; Steel Axles, $22.50 to $23; Iron Axles, $28 to $28.50; Wrought Turnings, $12.75 to $13, and Old Car Wheels, $19.50 to $20. A sale of 300 tons of Heavy Steel Scrap is reported at $16.75, Pittsburgh.

Coke.—A serious shortage in cars is again being felt in the Connellsville region, and furnaces are having trouble in getting prompt deliveries of Coke. We note a heavy demand for Furnace and Foundry Coke, and the market is very firm. Out of 11,367 ovens in the Connellsville region owned by the Frick Coke Company, only 372 are idle. All the available ovens of the W. J. Rainey Coke Company are active. A great deal of figuring is going on for Furnace Coke for first half of the year delivery, and prices ranging from $2.85 to $3 a ton at oven are being quoted. We can state that three or four contracts for Furnace Coke for first half of the year delivery have been made on an exchange basis of 7 tons of Coke for 1 ton of Pig Iron. We quote strictly Connellsville Furnace Coke at $2.85 to $2.90, and 72-hr. Connellsville Foundry Coke at $3.25 to $3.75 per ton at oven. The output of Coke of the Upper and Lower Connellsville regions last week was about 360,000 tons.

New York.

NEW YORK, October 17, 1906.

Pig Iron.—The market is characterized by persistent buying of spot Foundry Iron, and of Iron for the second quarter of 1907. For the former the market is very firm, with considerable variations in the prices asked and paid, each transaction practically standing on its own basis. For the second quarter, for which some large negotiations are pending, there is more disposition to book business. There have been some good sales of Basic Iron by Virginia furnaces, and one large eastern Pennsylvania Steel plant has purchased the greater part of 20,000 tons for the first half of 1907 on the basis of $19.60, delivered. Some additional importations of Scotch Foundry and Low Phosphorus Pig have been arranged for. We quote for tidewater delivery as follows: Northern Foundry, No. 1, $22.50 to $23, for prompt, and $21.50 to $22 for the first half of 1907; No. 2, $22 to $22.50 for prompt and $21 to $21.50 for the first quarter. For the second quarter $20.75 to $21 has been quoted. Southern Iron is sold at $21 to $21.50 for No. 2 Foundry, for early delivery, and $19.50 to $20 for 1907.

Steel Rails.—Small lot orders have made up the tonnage placed with Rail mills in the past week. The Baltimore & Ohio business, concerning which publication has been made, is in reality the giving of specifications on 66,000 tons previously contracted for and reported, 37,000 tons being placed with the Carnegie Steel Company and the remainder equally divided between the Cambria Steel Company and the Maryland Steel Company. The Southwestern tonnage that has been on the market for some time is now practically arranged for, a considerable portion of it being for extensions in Texas. A steady demand appears for new trolley line construction and extensions of existing lines.

Structural Material.—The new Singer Building on Broadway, north of Liberty street, the contract for which was mentioned in this report last week, will require 6000 tons of Structural Steel. Milliken Brothers, Incorporated, New York, who have the contract, expect to roll the Steel in their new Structural mill on Staten Island. The building will have 36 regular floors, on top of which will be a dome including four floors, the fortieth floor being 550 ft. above the curb. Bridge work has predominated in the Structural lettings of the past week. The American Bridge Company has a contract for 800 tons of Plate Girder bridges for the Illinois Central Railroad. The same company has taken an order for the new Iron Ore dock which the Chicago & Northwestern Railroad will build at Escanaba, Mich., requiring 900 to 1000 tons. The Pennsylvania Railroad has also let several hundred tons of work, a large part of it going to a bridge works at Allentown, Pa. The Levering & Garrigues Company, New York City, has the general contract for the construction of the ferry house and adjoining buildings for the New York Central Railroad's West Shore terminal at West Forty-second street. Announcement is made that the Canadian Bridge Company, Walkerville, Ont., has the contract to build next year a great Plate Girder bridge requiring 19,000 tons of Steel for the Canadian Pacific Railway. The structure will be about 1 mile long, and for the most part is 300 ft. high. The Structural market presents the same condition noticed for some time—namely, a wide variation in the bids on work coming up. While all Structural shops have been very busy, some show greater anxiety than others to get work to keep them steadily employed through the winter months. Structural mills are making deliveries in from one month to six weeks, though a great deal depends on the sizes of material. We quote as follows on mill shipments for delivery at tidewater: Beams, Channels, Angles and Zees, 1.84½c.; Tees, 1.89½c.; Bulb Angles and Deck Beams, 1.99½c. On Beams 18 to 24 in. and on Angles over 6 in. the extra is 0.10c. Beams and Channels out of stock are sold at 2¼c. to 2½c.

Bars.—The Bar market has been very strong during the week, with good transactions recorded in both Iron and Steel Bars. Bar Iron can no longer be had at the old basis of 1.60c., Pittsburgh, but the minimum is now believed to be 1.65c. or 1.79½c., tidewater, while many manufacturers are stated to be getting 1.84½c. The minimum on Steel Bars is 1.64½c., tidewater, but this is for remote delivery, good premiums being paid for anything like prompt shipment.

Plates.—Sales agents for Eastern mills report a fairly satisfactory volume of business, although few orders are received running over 100 tons. Probably the best business of the past week was 400 tons for a new Hudson River boat to be a counterpart to the most recent acquisition to the Hudson River fleet. The demand from local boiler shops and shipyards is considerably better than during the summer months. Quotations are firmly held as follows at tidewater on carload shipments: Sheared Tank Plates, 1.74½c. to 1.84½c.; Flange Plates, 1.84½c. to 1.94½c.; Marine Plates, 2.14½c. to 2.24½c.; Firebox Plates, 2.24½c. to 2.60c., acording to specifications.

Cast Iron Pipe.—Foundries are in such condition that they are absolutely unable to take care of any business for the remainder of this year and are well covered for the opening months of next year. Buyers are steadily coming into the market in greater numbers for their requirements for next year. A considerable number of large consumers have already placed orders for what they expect to need next season for both water and gas pipe. Prices are firm, on the basis of $32 per net ton at tidewater for carload lots of 6 in.

Old Material.—About 5000 tons of Heavy Melting Steel Scrap have been sold since our last report at about the prices then given as prevailing for such material. The parties making these sales have had the Scrap in transit, and were compelled to accept the prices offered, or otherwise, a higher rate would have been demanded. As winter approaches the accumulation of Steel Scrap seems to be getting smaller each week. This also applies to Cast Scrap, Stove Plate and Pipe Scrap. These grades have been moving very freely; in fact, being shipped as rapidly as accumulated. The railroad lists have all been closed out for October at very good prices. In many cases bids by consumers were above those made by dealers, although the latter had advanced their proposals considerably. No. 1 Railroad Wrought has sold at 50c. to $1 per ton higher than was brought by the September lists. Cast Borings and Wrought Turnings are in very good demand, and are selling at full outside prices. Standard Hammered Iron Axles and Steel Axles are in strong demand with short supply. Old Iron Rails are very scarce, little tonnage being available at any price. Old Steel Rails for rerolling are selling at $21.50 to $22, delivered, in eastern Pennsylvania, and the demand is in excess of the supply. Bundled Sheet Scrap has been sold in good quantities in eastern Pennsylvania and at Pittsburgh at $16.50 to $17, delivered. It is generally expected that prices on all kinds of Scrap will be higher before November 1, particularly Heavy

Melting Steel Scrap. Several of the larger brokers and merchants in the leading cities who sold large blocks of Heavy Melting Steel Scrap some time ago are still scouring the market trying to cover and are paying $1 to $2 per ton more than the price they received for it. Even at the advanced price they are paying they are having much difficulty in getting any tonnage whatever. One Steel plant, at tidewater, is willing to make purchases of large blocks of Heavy Melting Scrap for delivery after January 1, but so many dealers have been caught by selling ahead that they are now afraid to make further commitments of this character. Approximate prices for New York and vicinity, per gross ton, are as follows:

Old Iron Rails	$24.50 to $25.00
Relaying Rails	28.00 to 28.50
Old Steel Rails, rerolling lengths	18.50 to 19.00
Old Steel Rails, short pieces	16.25 to 16.75
Heavy Melting Steel Scrap	16.25 to 16.75
Standard Hammered Iron Car Axles	29.00 to 30.00
Old Steel Car Axles	22.00 to 22.50
No. 1 Railroad Wrought	21.00 to 21.50
Iron Track Scrap	18.00 to 18.50
No. 1 Yard Wrought, long	18.50 to 19.00
No. 1 Yard Wrought, short	18.00 to 18.50
Wrought Pipe	14.50 to 15.00
Light Iron	10.00 to 11.00
Cast Borings	10.00 to 11.00
Wrought Turnings	13.00 to 14.00
Old Car Wheels	19.75 to 20.00
No. 1 Machinery Cast	17.00 to 17.50
Stove Plate	13.50 to 14.00
Grate Bars	12.50 to 13.00
Malleable Cast	17.50 to 18.00

Metal Market.

NEW YORK, October 17, 1906.

Pig Tin.—The strength of the London market continues in spite of limited sales in this country. This condition of affairs naturally leads to the idea that should any heavy buying set in the market would be rapidly forced upward. As it is, the market appears to be weaker than it really is, on account of selling by second hands or speculative holders who are disposed to take profits. How long consumers in this country can hold off from purchasing larger quantities is a question, but it is well known that the Tin Plate mills are exceedingly busy, as is also the case with the manufacturers of electrical supplies and other lines in which Tin is used in large quantities. When consumers stay out of the market for a period of six to eight weeks it is equivalent to their going short of metal. The London market has advanced sharply this week, and closes to-day at £199 5s. for spot and £198 5s. for futures. Prices in this country show a steady advance, 42.40c. being quoted on Thursday and advancing to 42.45c. on Friday and 42.62½c. on Monday. Tuesday there was a more marked advance in London and sales were made at equal to 43.05c. The market closes higher to-day at 43.40c. The imports so far this month amount to 2240 tons, and there are afloat for American ports 2670 tons. An interesting tale from London is to the effect that a coterie of speculators who have recently realized handsome profits on Copper are now turning their attention to the Tin market and promise to put prices to a new high level.

Copper.—Business during the week has been rather limited, but enough transactions have been made to show that the market for Lake and Electrolytic for this and next month's delivery is well above 22c. The persistent rumor that was circulated earlier in the week regarding the sale of a carload of Lake at 23c. was given rather too much publicity to have it universally accepted. However, it is not to be doubted that if a carload of Lake could be obtained for prompt shipment it would readily command that price. We learn of sales of Electrolytic for November shipment at 22½c., and for shipment during February and March within the range of 21.25c. to 21.75c. for both Lake and Electrolytic. As it is, there will probably be enough metal to go round, but recourse will have to be taken to old materials. Copper in manufactured forms is rapidly mounting upward, Sheet Copper having been advanced on the 10th to 27c. per lb. It is said by one well acquainted in the trade that the probabilities are that the greater part of the business for delivery for the first half of the year 1907 will be done at prices above 20c. As it is, sales have been made up to the end of the first quarter, but the larger producers, who have the best interests of the trade at heart, are not disposed to sell for delivery beyond February 1, 1907. The high prices and large premiums which are being demanded seem to have no effect on consumption. The London market showed an advance of £2 7s. 6d. on the opening cable to-day, and closes with another advance of £1 at £103 for spot and £102 15s. for futures, and £107 for Best Selected, which is equivalent to 22.12½c. The exports so far this month aggregate 8404 tons. The increase of activity in Europe is clearly shown by the importation of 87,515 tons into Germany during the first eight months of this year, and an increase of consumption from 64,980 tons to 80,504 tons. The total exports from this country for the first nine months of this year were 154,626 tons, as compared with 190,726 tons during the same period last year.

Pig Lead.—The market is stronger, and while there are a few stray lots offered at 5.95c., the bulk of the metal in this section is held for higher prices. There is a very fair demand and sales have been made on a basis of 5.92½c. to 5.95c., St. Louis. The London market, after touching £20 at the end of last week, declined and closes to-day at £19 10s.

Spelter.—Prices are a trifle firmer, 6.25c. being quoted in New York and 6.12½c. in St. Louis. There is a better demand, particularly for Brass Mill Spelter. The London market is steady at £28 5s.

Antimony.—There has been rather more activity in buying by dealers for late deliveries, and there is a divergence of opinion whether the market will remain stationary or go lower. At present Cookson's is quoted at 25.25c., Hallett's at 24.75c. and outside brands at 24c. to 24.50c.

Nickel.—The price continues unchanged, large lots being quoted at 45c.; smaller quantities at 55c. to 60c.

Ferroalloys.—The tendency is toward higher prices in most lines, but Ferromanganese is slightly easier. For 50 per cent. Ferrosilicon $96 to $100 is quoted and for 75 per cent. $150. Some foreign manufacturers have withdrawn prices for the present. Ferrochrome is unchanged.

Aluminum.—There is a good demand, but deliveries are so belated and uncertain that business is limited. Prices are unchanged at 36c. for No. 1 Ingots and 34c. for No. 2.

Tin Plate.—The European market is a trifle firmer, but no new business is reported for American shipment, the rapid advance militating against any export to this country. As it is, American manufacturers are in a little better position regarding deliveries, but they are still much behind, and it is hard to see where any marked improvement will be made until a larger supply of Steel is assured. For 100-lb. IC Bessemer Coke Plates $3.94 is quoted, f.o.b. New York, and $3.75, f.o.b. Pittsburgh, subject to the usual trade discounts. In Swansea Welsh Plates are unchanged at 14s.

Old Metals.—Prices are higher, but it is impossible to quote any exact range, as the urgency of a consumer's requirements may influence a sale to a marked degree. The present prices are resulting in large quantities of Copper Scrap being brought to the market. Dealers' selling prices are as follows:

	Cents.
Copper, Heavy Cut and Crucible	20.50 to 21.50
Copper, Heavy and Wire	20.50 to 21.00
Copper, Light and Bottoms	19.00 to 20.00
Heavy Machinery Composition	18.00 to 18.50
Brass, Heavy	15.00 to 15.50
Brass, Light	12.50 to 13.00
Clean Brass Turnings	13.75 to 14.25
Composition Turnings	15.50 to 16.50
Lead, Heavy	5.75
Tea Lead	5.50
Zinc Scrap	4.75

Iron and Industrial Stocks.

NEW YORK, October 17, 1906.

A most interesting event in the market for iron and industrial stocks the past week was the upward movement in United States Steel common, which touched 50¼ on Friday and Saturday. This is the highest figure recorded since the stock was first put on the market in 1901, when it sold up to 55. In the early part of 1904 it had declined to 8⅝. The recent advance to over 50 is accepted as evidence of the restoration of this stock to favor on the part of both the speculative and investing public. The range on this stock from Thursday of last week to Tuesday of this week was from 48½ to 50¼. The preferred during the same period ranged from 107½ to 108½. A sharp advance was made in Pressed Steel common yesterday and to-day. The stock had been selling at 54 for three previous days, and on Tuesday it advanced to 57¼, touching 59½ this morning. The range of other stocks from Thursday to Tuesday was as follows: Car & Foundry common 45 to 46¼; Locomotive common 76⅛ to 78; Steel Foundries preferred 44 to 44½; Colorado Fuel 55½ to 57¾; Railway Spring common 52 to 53¾; Republic common 37 to 38¾, preferred 98½ to 99; Sloss-Sheffield common 74½ to 75¾; United States Cast Iron Pipe common 48 to 49½; Can preferred 56 to 57. Last transactions up to 1.30 p.m. to-day are reported at the following prices: Car & Foundry Common 46, preferred 101¾; Locomotive common 76⅞, preferred 112½; Steel Foundries common 10½, preferred 44; Colorado Fuel 56; Pressed Steel common 58¾, preferred 99; Railway Spring common 54; Republic common 37½, preferred 98⅝; Sloss-Sheffield common 75¼; Tennessee Coal 157; United States Cast Iron Pipe common 48¼, preferred 90; United States Steel common 49⅝, preferred 107⅛; Can common 6½, preferred 56. United States Steel second mortgage, 5 per cent. bonds, sold to-day at 101, the highest price ever reached by them.

The Ingersoll-Rand Company's stock and bonds have been listed on the New York Stock Exchange, the following securities having been approved by the Governing Committee October 10: Two million dollars first mortgage 5 per cent. bonds, $4,500,000 6 per cent. cumulative preferred stock

and $3,000,000 common stock. In making the application the company submitted the following approximate statement of earnings and expenses from January 1 to June 30, 1906:

Net sale of merchandise		$2,653,304
Miscellaneous income		16,194
		$2,669,498
Expenses, material and supplies, interest, &c.		2,529,608
		$139,890
Increase in inventory		400,000
		$599,890
Depreciation on plants		184,163
Estimated net earnings		$415,727
Less interest on bonds	$50,000	
Dividend on preferred stock	135,000	
		185,000
Estimated addition to surplus		$230,727

Dividends.—The United States Cast Iron Pipe & Foundry Company has declared a quarterly dividend of 1¾ per cent. on the preferred and 1 per cent. on the common stock, both payable December 1.

The International Steam Pump Company has declared the regular quarterly dividend of 1½ per cent. on the preferred stock, payable November 1.

Henry R. Worthington, Incorporated, has declared the regular semiannual dividend of 3½ per cent. on the preferred stock, payable November 1.

The Harbison-Walker Refractories Company, Pittsburgh, has declared a quarterly dividend of 1½ per cent. on the preferred stock, payable October 20.

The Fort Pitt Spring & Mfg. Company.—This company, whose offices are in Farmers' Bank Building, Pittsburgh, with plant at McKees Rocks, Pa., is preparing to take up the manufacture of elliptic springs and pressed steel journal box lids, in addition to coil springs, which it now manufactures. It has awarded a contract for a steel structure 100 x 100 ft., one and one-half stories high, to adjoin its present plant. A balcony will run the entire length of the building and will accommodate the light machinery, while the lower floor will be used for heavy machines and the fabricating department. Elliptic springs of all sizes for general use will be made, including those for automobile use. The company will continue to operate its present plant in the manufacture of coil springs. William McBride, formerly with the Standard Underground Cable Company, is president; John D. Culbertson, Jr., formerly with the National Tube Company, is secretary and treasurer; Roy A. French, formerly of the A. French Spring Company, is general superintendent, and Louis T. Girdler is mechanical engineer.

The eight steel steamers for which orders were placed with the American Shipbuilding Company last week by the Lackawanna Steamship Company, as noted in these columns, are for 1907 delivery, the last of the eight being promised for August 1. Five of the steamers will be of the 7000-ton class, being 440 ft. over all, 52 ft. beam and 28 ft. deep. The remaining three will be of the 8000-ton class, being 500 ft. over all, 52 ft. beam and 30 ft. deep. The purchase is not made by the Lackawanna Steel Company, but by Moses Taylor and others identified with that company. In connection with the placing of this order announcement is made of the transfer of the Ship Owners' Dry Dock Company of Chicago, owned by Moses Taylor and others, to the American Ship Building Company in part paymnt for the vessels ordered. The American Shipbuilding Company now has control of all shipyards and dry docks on Lake Michigan with one exception. The new fleet of the Lackawanna Steamship Company will be managed by Pickands, Mather & Co., Cleveland, Ohio.

On October 16, Andrew Carnegie opened the new engineering and natural philosophy departments of the Edinburgh University, Edinburgh, Scotland, which were erected largely by his donation. The degree of Doctor of Laws was conferred on Mr. Carnegie.

The report of negotiations by the American Bridge Company for the acquisition of the Berlin Construction Company, Berlin, Conn., is denied on authority. The American Bridge Company already has a large plant 4 miles from the one in question.

The National Machine Tool Builders' Association.

The fifth annual convention of the National Machine Tool Builders' Association, held at The Breslin, New York, October 9 and 10, was one of the best, from the standpoint of attendance, ever held by this organization. The New York meeting of this association has become an important event in the machinery trade, inasmuch as it offers an occasion for a general gathering of the clans from all sections of the country. It thus furnishes an excellent opportunity for machinery manufacturers to meet socially and strengthen the ties of brotherhood existing between the leaders of the various branches of the industry that can only be accomplished at a general assemblage of this kind.

That the manufacturers of machine tools throughout the country who have heretofore been backward in joining the association are realizing the benefits of seeing their fellow workers occasionally and coming in personal contact with each other is evidenced by the fact that 15 applications for membership to the association were presented, bringing the total membership up to almost 80 of the most important machine tool builders of the country.

Manufacturers in kindred mechanical lines who had been invited to participate in the splendid entertainment events provided were keen to see the advantages of meeting the machine tool builders, a very large number of them being present. The dealers were also well represented, as might be expected, for to them the advantages of having the opportunity of meeting at one place the various manufacturers whom they represent appeal particularly.

The business sessions were short, as there was little to do besides the election of officers for the coming year. The election resulted as follows: President, E. M. Woodward, Worcester, Mass.; first vice-president, Wm. Lodge, Cincinnati, Ohio; second vice-president, F. E. Reed, Worcester, Mass.; treasurer, W. P. Davis, Rochester, N. Y.; secretary, P. E. Montanus, Springfield, Ohio.

E. P. Bullard, Jr., Bridgeport, Conn., presented a paper on the subject of "Apprenticeship," it being his report as chairman of the committtee appointed at a previous meeting to investigate this subject and recommend a standard system to be followed throughout the country, offering inducements to young men to learn the machinists' trade. Mr. Bullard's paper was enthusiastically received, and after receiving the association's thanks for the good work it has performed thus far, the committee was continued to pursue its investigations still further, with a view of definite action in the way of the adoption of the system suggested at the next meeting of the association.

The subject of the education of young men preparatory to their entering the mechanical trades received considerable attention on the part of the association and it was suggested that President Woodward, who is interested in the work of the Worcester Education Association, make efforts to induce men who have made a study of the work to address the association at a future meeting.

J. N. Gunn, New York, one of the leading experts on cost systems in the country, delivered a very interesting address on the subject of "Costs" at the meeting on Tuesday afternoon. Mr. Gunn pointed out the fact that the association could accomplish great good for its members if a uniform system of determining costs were adopted by them. He said that it did not matter just which system was adopted, so long as all the members worked on the same basis. A committee consisting of Fred. A. Geier, Cincinnati, Ohio; E. P. Bullard, Jr., Bridgeport, Conn., and C. H. Alvord, Torrington, Conn., was appointed to look into the subject and report at the next meeting of the association.

The entertainment features, which were very largely patronized and greatly enjoyed by every one, consisted of a luncheon at the Hotel Imperial, tendered by the Hill Publishing Company, and a boat ride to West Point, tendered by the Industrial Press.

The Republic Iron & Steel Company.

The annual meeting of the Republic Iron & Steel Company was held at Jersey City, N. J., Wednesday, October 17. The directors chosen for the term expiring in 1909 are G. Watson French, J. B. Duke, Harry S. Black, T. W. Guthrie, and Wm. H. Hassinger. The new directors are J. B. Duke, Harry S. Black and T. W. Guthrie, who succeed A. W. Thompson, Harry Reubens and the late C. S. Guthrie. The report of President Topping, for the Executive Committee, was submitted, covering operations for the fiscal year ending June 30, 1906:

In the treatment of charges against net profits, a change of policy in accounting has been adopted, which resulted in charging off $250,000 for depreciation to plants. This is in excess of the usual charges for maintenance and repairs, which for the year aggregated the sum of $973,000. For reconstruction and renewals, a further charge of $200,930.92 was absorbed, together with $97,308.20 for account of the exhaustion of mineral lands. An item of $810,302.62, for discount on the sale of the company's $10,000,000 bond issue, heretofore carried as an asset (the intention being to sink this charge by an annual provision over a period of years), is now written off. After making provision for the 7 per cent. dividend on preferred stock, and all bond charges, from the net profits for the year, the balance of earnings was carried forward to surplus and against this fund of accumulated earnings deferred dividends on the preferred capital stock, aggregating $1,097,408.37, were charged, and in addition $278,713.15 was written off for depreciation on sales of property not necessary for the operations of the company.

The income account and statement of surplus for the year ending June 30, 1906, is as follows:

Net earnings after charging $973,000 for maintenance and repairs		$3,574,374.13
Interest and dividends on investments		203,027.19
Total		$3,777,601.32
Less expenditure on reconstruction	$200,930.92	
Depreciation written off	250,000.00	
Provision for exhaustion of minerals	97,308.20	
		548,239.12
Net profits for the year		$3,229,162.20
Deduct interest on first mortgage bonds	$421,538.06	
Interest on collateral trust notes	69,062.92	
Dividends on preferred stock, 7 per cent., for year ending June 30, 1906	1,429,183.00	
		1,919,783.98
Surplus for the year		$1,309,378.22
Surplus at June 30, 1905		4,010,329.65
Total		$5,319,707.87
From which there has been appropriated:		
For arrears of dividend on preferred stock 5⅝ per cent., leaving 8 per cent. still unpaid	$1,097,408.37	
For depreciation in value of properties, and investments sold	278,713.15	
For balance of bond discount and expense	810,302.62	
		2,186,424.14
Net surplus carried to balance sheet		$3,133,283.73

The net working assets after discharging all obligations except bonded debt are $7,974,044.17. Funds have been established for exhaustion of mineral lands, for fire and accident insurance and furnace relining, the total in the three funds being $711,095.62. The amount specially written out of surplus for the year is $2,186,424.14 as against nothing in preceding years.

The balance sheet shows cost of property as at July 1, 1905, to be $49,200,618. Additions during the year after deducting amounts realized on sales, also provision for depreciation, were $1,777,760. The new construction included expenditures for coke ovens, new blast furnaces at Haselton, O., and Birmingham, Ala., Bessemer plant, rail and sheet bar mill at Youngstown, Ohio, and continuous merchant mills at Youngstown and at Moline Ill. The items under current assets include inventories of manufactured products, materials and supplies, $3,693,404; accounts and bills receivable, $3,656,583; cash, $3,253,283.

The gross sales in the year were $26,196,438, as against $22,188,842 in the preceding year. The output of finished and semifinished products, leaving out the tonnage of the latter used for conversion, was 742,435 tons as against 672,012 in the fiscal year of 1905, 456,833 tons in 1904, 577,222 tons in 1903 and 576,609 tons in 1902. The pig iron production for the year was 493,344 tons, against 442,640 tons in the preceding year. With the two new Haselton furnaces completed the company will have nine furnaces with 850,000 tons capacity—of which 600,000 tons is represented in the northern district. The iron ore production of the year was 970,106 tons, against 794,167 tons in the previous year. The ore reserves have been strengthened by the development of territory heretofore unexplored and by additional purchases under term contracts. The ore reserves in the Lake Superior region are put at 22,870,755 tons and in the Southern district at 49,041,800 tons.

A Large Purchase of Southern Iron Mines.

Negotiations were concluded in the past week by which the Tennessee Coal, Iron & Railroad Company and the Republic Iron & Steel Company acquire the extensive Red Mountain, Ala., iron mines and lands, owned by M. L. Potter of Brooklyn, N. Y. The Potter properties are from 12 to 14 miles south of Birmingham, and consist of 1800 acres, underlaid by red ores to an amount exceeding 60,000,000 tons. The Tennessee and Republic companies have been taking ore from leased mines on these lands for some time, the former from mines known as Potter No. 1 and Potter No. 2, and the latter from the Raimund mine, located between the Potter mines and the well-known Muscoda mines of the Tennessee Company. The Potter tract lies between important Red Mountain fee properties which the Tennessee Company has been operating for some years. The first work to be done on the newly acquired lands will be the driving of another slope at Raimund to increase the ore supply of the Republic Iron & Steel Company. The purchase price is reported to be $800,000, of which $700,000 is in 5 per cent. bonds and $100,000 in cash.

The ores from the Potter mines are considered among the most desirable in the Red Mountain District, carrying sufficient lime to be practically self-fluxing. They are also lower in silica than the ores taken from the Tennessee Company's mines nearer Birmingham. They run about 38 per cent. in iron and from 14 to 16 per cent. in lime.

The acquisition of the Potter lands in fee gives the two companies a large supply of desirable ores working well in furnace mixtures which heretofore have had considerable percentages of red fossil ores higher in silica and lower in iron and lime.

A Southern Steel Company Acquisition.

Announcement is made of the purchase by the Southern Steel Company of the properties of the Georgia Iron & Coal Company. These include the blast furnace at Rising Fawn, Ga., 330 coke ovens and coal and iron mines, with 51,000 acres of mineral lands in northern Georgia. The brown hematite ores on these properties represent the variety of Southern ores of which the supply is limited, as compared with the red fossil deposits, and their iron content is higher, running well up to 50 per cent. The properties just acquired insure an ample ore supply to the Alabama furnaces of the Southern Steel Company for a long term of years. Shipments can be made at moderate freights to the furnaces at Gadsden and Trussville.

The United Engineering & Foundry Company, Pittsburgh, has purchased outright the plant of the Mahoning Foundry & Machine Company at Youngstown, Ohio, together with eight acres of ground, with the intention of increasing its iron foundry facilities and also for establishing a large foundry in the Youngstown district for the making of steel castings. The foundry is 130 x 240 ft., but it is the intention of the United Engineering & Foundry Company to enlarge the plant considerably, plans for which are now under way.

The Machinery Trade.

NEW YORK, October 17, 1906.

Considerable was heard in the trade the past week concerning the rapid advance in the price of foundry pig iron and it is now claimed by many to be too close to the danger point to augur well for the machinery trade. Just now, when machinery houses are enjoying an almost unprecedented business, with such bright prospects for the year to come, it is too bad that this cloud should appear on the horizon to disturb conditions and make manufacturers feel apprehensive as to the near future. Machinery houses say that the only course left open to them is to advance prices to cover the advance in iron, but to do this, it is feared, will scare intending purchasers away. During the year practically all machine tools have advanced in price from 15 to 20 per cent. and already there is talk of a further advance. Certain manufacturers have called in their price sheets the past week, presumably with the intention of marking them up. It will be seen that another advance, especially on the heaviest class of tools, sufficient to cover the advance in pig iron, would make the cost of these tools to the buyer considerably in excess of that paid only a few months ago. It is feared that at such figures purchasers will hold aloof from the market. The advance in prices of machine tools has to some extent curtailed the purchases the railroads intended making this year, as the appropriations for shop improvements have in many cases been used up. As it is getting toward the close of the year it is thought that some of the railroads from which good orders are expected will delay purchases until the first of the new year, when fresh appropriations for shop equipment will be made.

Railroad Requirements.

It is understood that the two prominent machinery houses and a number of others have received lists from the Delaware, Lackawanna & Western Railroad covering a good sized number of requirements for new shops at Kingsland, N. J. The power men have also some applications before them for bids for equipment for this plant, and it is understood that some orders have already been given, especially for the larger sizes of machine tools. There is some blacksmith shop equipment to be bought, and altogether it looks as though the company is at last fitting out entirely the extensive plant at Kingsland which has been built for some time. The system of shops is one of the largest of the company's plants and in addition to the section repairing and other machine shop work arrangements have been made to build some cars along special lines. The company has erected a main building for the paint and coach departments, 170 x 660 ft., with an L 50 x 268 ft. There is also a mill building, 70 x 264 ft., and an annex building, 70 x 300 ft., used as a cabinet shop, upholstering room and varnish shop. The machine shop is 126 x 606 ft., and some part of it has been put in commission. The buying now going on, it is understood, is to equip the rest of it and to run the entire plant full capacity. G. F. Wilson, purchasing agent, whose headquarters are at 26 Exchange place, New York, is in charge of the buying.

The tool programmes of the Pennsylvania Railroad have now been practically brought to a conclusion by requisitions which have been issued by the purchasing department for most of the tools and machines which it is intended to purchase. Supplementary inquiries continue to be issued for extra and special equipment which unforeseen contingencies or new methods make necessary. A recent inquiry covers a two-spindle rod boring machine, maximum distance between centers to be 10 ft. A horizontal machine is desired for this purpose, so that both sides of the rod brasses can be faced without turning the rod, but a vertical machine will have to be used if there are no horizontal machines made. On the same day an inquiry was made for one 30 x 30 in. by 8 ft. planer, belt driven, two heads on cross rail and one on upright. The following inquiries have also been made: One pneumatic turntable motor for operating standard 75-ft. turntables, the motor to be capable of turning one of the heaviest engines, making the complete circle in 30 seconds; one 1½-ton electric hoist and trolley, the motor voltage to be 110 d. c., and the trolley is to run on two rails whose gauge is 12 in., the rails being carried by two 6 x 12 in. timbers, distance between centers 13½ in., the trolley to be moved by gear wheels and hand chain, the hoist to have 15 ft. travel; one six-spindle nut tapper for tapping nuts ½ to 1½ in., the machine to be furnished complete with pump, countershaft, chip pans, sockets, taps, wrenches, &c.; one 42-in. vertical boring and turning mill, having two heads on cross rail, machine belt or motor driven.

The machine tool list sent to the trade about two weeks ago by the Atlantic Coast Line covered between $20,000 and $30,000 worth of machine tools, exclusive of cranes and power plant equipment, and altogether the requirements amount to quite a substantial figure. The company has sent out a few inquiries this week for machines not included in the list and it is now placing orders for some of the machines. It is understood that the orders being placed this week cover only a few of the machines and that the major portion has not yet been arranged for. This machinery is to be installed in the company's shops at Waycross, Ga., where important improvements were made some time ago, and the list now before the trade is the second one which has been issued for machinery for these shops. Purchases are being made from the office at Wilmington, N. C.

The Western Atlantic Railroad, whose shops at Atlanta, Ga., were recently destroyed by fire, has done nothing as yet toward preparing for the rebuilding of the structures. It is probable, however, that the company will come to some decision very shortly, and the machinery trade can very likely look for some nice orders for machines to replace those destroyed in the fire. It is reported that at the present time only temporary shops will be erected and that new shops will be erected later on at Hill's Park, about 5 miles from Atlanta, on the site of the company's freight yards.

The Buffalo Forge Company, manufacturer of heating and ventilating apparatus, engines, pumps and plantation machinery, Buffalo, N. Y., has increased its capital stock from $1,000,000 to $1,250,000, and will use a considerable portion of the increase for the enlargement of its plant at Broadway and Spring streets, and the remainder for the extension of the company's already large foreign trade. The first of the new buildings will be of brick and steel, 125 x 215 ft. x 32 ft. in hight, having a very high first story to accommodate the construction of the large steel plate framed fans made for mine ventilation and mechanical draft, some of which are 300 in. and over in hight. Into this new building will be concentrated all the sheet metal work manufacturing departments, and the space in the present buildings gained by the removal of the sheet metal departments will be devoted to the enlargement of the several branches of the export department. Notwithstanding the company has erected several new buildings, including a modern foundry, within the past year or so, the increased manufacturing room secured has not been sufficient to care for the constantly increasing demand for its products.

Considerable machinery equipment will probably be purchased by the Union Mfg. & Supply Company, Hattiesburg, Miss., which is to erect a modern machine shop, foundry and ice plant having a daily capacity of 75 tons. The company, which is incorporated with a capital stock of $200,000, will commence business as soon as $100,000 has been paid in, but will not be ready to buy the material for its new plant until January 1.

The Keystone Driller Company, Beaver Falls, Pa., has purchased a large tract of land adjoining its present property at a cost of about $50,000. A good part of the property will be used for the erection of new buildings, the construction of which will not be undertaken before spring, as the company is now fully occupied with an addition to its plant, the erection of which was started about six months ago. The sizes and number of the new buildings to be erected have not yet been determined, but a complete steel foundry will probably be included. The balance of the property not used for the company's own needs will be sold for manufacturing sites.

The Guggenheim interests, which have been important factors in the machinery trade for the past year, have decided upon further building operations that will necessitate the purchase of a very large quantity of machinery. It is the intention to build a large smelting plant at Ely, Nev., through two of their copper companies, the Nevada Consolidated and Cumberland Ely companies, each of which has extensive bodies of ore ready for smelting. It is said that the new plant will cost several million dollars and that arrangements have been made for building it, one-half of the expenses to be defrayed by each of the companies. Purchases of equipment will probably be made at the New York office, 71 Broadway.

A movement is under way for the installation of an auxiliary high pressure salt water system in the business section of San Francisco, Cal., following the plans of the systems successfully installed in Philadelphia and New York. The installation of the systems in the two latter cities necessitated the purchase of a large amount of pumping machinery, boilers, &c., and the decision to install a complete system in San Francisco will be of considerable importance to manufacturers of this class of machinery.

F. M. Andrews & Co., who have offices in the Waldorf-Astoria, New York, have inquiries out for equipment to be installed in the paper box manufactory to be built in Brooklyn for H. Bridgeman Smith. The company now has inquiries out for power equipment and the requirements include two vertical cross compound engines with a capacity for operating 500-kw. generators. Bids are also being asked on one vertical cross compound engine, capable of operating a 150-kw. generator, stokers, pumps, condensers and similar equipment. In the specifications it is stated that within a

year the interested parties will ask for bids on further power equipment. The Andrews Company, it is understood, has charge of the general construction and will get bids on elevators and other mechanical equipment to fit out the plant. It is proposed to complete the factory and get it in operation as soon as is practicable.

Philadelphia Machinery Market.

PHILADELPHIA, PA., October 16, 1906.

An increased volume of business is pretty generally enjoyed by both manufacturers and merchants in this territory. There seems to be more freedom displayed in the placing of orders, although it is quite true that the market is carefully looked over for possibilities in the way of more advantageous deliveries before any orders are placed. Buyers have by this time learned pretty thoroughly the conditions under which manufacturers are operating and lengthy delays in placing orders have frequently resulted in not only withdrawal of delivery dates but also of prices, with a subsequent extension in the former and an increase in the latter.

The greater proportion of the week's business has been of the single tool variety. Lathes seem to be in the greater demand, but are confined to the medium and smaller sizes. Tools for special purposes are being freely ordered, and many of these run quite heavy. Several orders for machine tools have been given out by the Pennsylvania Railroad, which were taken by local concerns. These, however, were not new propositions, but some business which was left over from the general list before the trade sometime ago. Orders against recent specifications for some of the Southern railroads are now being looked forward to, while lists for some fair lots of tools from nearby roads are expected out at an early date.

Inquiries continue to be received in good quantity, the number being rather on the increase than otherwise, a condition which presages continued activity in the trade for a long period ahead. Manufacturers are busy in every line. Orders coming in are in most cases in excess of the normal capacity of plants, under which conditions it is impossible for makers to catch up on deliveries. Delays in obtaining raw materials handicap production in a number of instances, and some manufacturers complain considerably about their inability to get skilled mechanics.

The foreign trade continues favorable. In the special tool field builders have taken on some nice business and the demand appears to be fairly active. While standard machine tools seem to be in more or less demand, the local trade is giving this class of tools but little attention.

The demand for boilers and engines is improving. Sales of high power equipment are reported, as are also a number of contracts for the installation of medium power boilers and engines. This trade on the whole seems to drag somewhat, particularly in the local field, and both builders and dealers complain of the delay in consummating business which months ago they anticipated closing.

Second-hand machinery is in active demand. Desirable tools find ready sale, the only difficulty experienced by the dealers being that of getting enough tools to go around. The market is being pretty carefully gone over, particularly where tools must be had promptly to carry out work on hand, and tools which will meet purchasers' requirements are quickly disposed of.

Foundries continue taking on quite a heavy tonnage both in gray iron and in steel castings. In some lines of gray iron work castings are hard to obtain promptly, and builders of machine tools complain considerably about local deliveries. Steel casting plants have more business offered than can be handled for early delivery. In some instances their productive capacity for the remainder of the year is fully taken, while considerable business for 1907 has already been booked.

The Standard Roller Bearing Company has let the contract for the erection of a one-story machine shop on the north side of Merion avenue, above Fifty-first street, to H. E. Grau & Co. The new shop will measure 50 x 233 ft. and the work will be started at once. The equipment for this shop has not been fully decided upon, but will include a general line of tools. This equipment is in addition to that mentioned in these columns last week and is expected to aggregate an expenditure of nearly $100,000, specifications for which will probably be ready in two or three weeks.

Plans are being prepared for the D. B. Martin Company for a large abattoir to be erected at the southwest corner of Thirtieth and Market streets. This plant is to be the largest and most complete of its kind in this city. The building will be six stories high, 153 x 220 ft. An extensive power equipment, and machinery peculiar to the business, as well as some general machinery, will be required, but plans for this have not been fully decided upon.

The Ajax Metal Company has taken permits from the Bureau of Building Inspection for a one story brick addition to its foundry located on Frankford avenue below Richmond street. Whether any additional equipment will be required has not been announced.

The Birdsboro Steel Foundry & Machine Company, Birdsboro, Pa., reports a greatly increased output in both its steel and iron foundries during the past month. The customers who during the recent labor troubles at this plant were forced to go elsewhere for their castings have returned and a large amount of additional business has been placed on the books, including locomotive castings, heavy mill machinery castings, such as housings, rolls, mill tables, &c., as well as high pressure steel fittings. The machine department is also very busy. Many parts of the plant are working double turn and the general equipment is being enlarged, in order to facilitate the handling of the increasing business.

Wickes Brothers, through their local office, report business in good volume. There has been quite a demand for air compressors, mostly of the smaller types, and for boilers of medium capacities. Inquiries are in good number, and the outlook for future trade is considered favorable. Among some of the recent deliveries by this branch were two 250-hp. Wickes' vertical water tube boilers, large boiler feed pumps and one 1,500,000-gal. pump for the Warwick Iron & Steel Company, Pottstown, Pa.; a 250-hp. Wickes' water tube boiler for a Reading concern, and two of the same class and power for the Pittsburgh Construction Company. A duplex air compressor, having a capacity of 375 cu. ft. of free air per minute, was furnished a concern in Salem, N. J., and a 125-hp. engine has been delivered the Tennessee Lumber Company, Evergreen, N. C.

The Baldwin Locomotive Works made a record production in the month of September, completing 265 locomotives, an average of 10.6 for each working day. This concern is exceedingly busy in every department. Orders are coming in rapidly, and sufficient work is on the books to keep the plant actively engaged for many months. An order for 100 locomotives, subject to April 1, 1907, confirmation from the Pennsylvania Railroad is among those recently booked. The Baldwin Works now has employed the largest force in its history, 19,500 being on its combined rolls at the local and Eddystone plants, with 3775 at the Burnham Works, making a total of 23,275.

Chicago Machinery Market.

CHICAGO, ILL., October 16, 1906.

Contracts are now being placed by the Chicago, Milwaukee & St. Paul Railroad for its machinery requirements to be used in equipping an extension to its machine shop, 45 x 310 ft. The list, which was published in *The Iron Age* of September 27, comprises 72 tools, and their estimated cost is placed at $100,000. The company is also in the market for boilers aggregating 1200 hp. capacity, which will be installed in the 60-ft. addition to the power house. At the present time the capacity of the car shops is 28 cars daily, while the equipment of the locomotive works is being added to to provide increased capacity from 6 to 10 locomotives. A list of the blacksmith shop requirements will be promulgated shortly. The Chicago & Western Indiana Railroad will shortly issue a list of tools for installation in local shops which are now being improved. The general demand for tools and equipment shows no decline, and builders are constantly falling farther behind in deliveries. On milling machines it is difficult to secure shipment before April, and local dealers are securing premiums on desirable tools from stock.

Cobb & Drew, manufacturers of iron, brass and copper rivets, spring cotters, staples, burrs, washers, stove and tire bolts, operating plants at Plymouth, Mass., and Rock Falls, Ill., have been compelled to build another addition to the latter works on account of the constantly increasing demand for its production throughout the West. The building that is now under construction is 50 x 100 ft. and three stories high. It will provide increased facilities for the manufacture of its goods, as well as increased warehouse capacity. Machinery for the nut and bolt departments will be required.

The R. J. Schwab & Sons Company, Milwaukee, Wis., manufacturer of the Gilt Edge warm air and combination heaters, has let contracts for the erection of a reinforced concrete machine shop, five stories high, 50 x 90 ft., and also for a reinforced concrete power house, 35 x 80 ft. Contracts for the additional machinery required have all been placed, and the power equipment will consist of a 125-hp. Rathbun three-cylinder gas engine made by the S. M. Jones Company, Toledo, Ohio; producer made by the Smith Gas Power Company, Lexington, Ohio, and generators made by the Fort Wayne Electric Company, Fort Wayne, Ind. While the company has satisfied its wants in the machinery line, it

is interested in a burner which will burn producer gas for heating purposes and in apparatus for the utilization of the waste heat from the water jacket and exhaust of the gas engine for heating purposes.

The Chicago House Wrecking Company, Chicago, which recently sustained damage by fire destroying its pipe and roofing departments, began rebuilding at once and is now arranging to double the capacity of these departments. New machinery is being installed and a large fireproof building is being erected. These departments are now in charge of L. S. Simon, formerly in charge of the Block-Pollock Company's business at St. Louis. The company is extending its operations to include relaying rails and is also expanding in the direction of iron, hardware and other materials for construction purposes.

Churchill & Spalding, Chicago, manufacturers of the Durand steel lockers and wardrobes, are about to let contracts for a factory building and a separate power house and enameling plant. The factory will be one and two stories, 200 x 250 ft., of brick and stone construction, with composition roof.

The Hicks Locomotive & Car Works, Chicago, whose plant is located at Chicago Heights, Ill., is in the market for two second-hand 75-kw. generators, 220-volt, direct current, and one second-hand 350 or 400 kw. alternating current 440-volt 60-cycle generator, both belt driven. This company has under consideration extensions to its blacksmith and machine shops, but plans have not yet been prepared.

The Illinois Iron & Bolt Company, Carpentersville, Ill., has certified to an increase in capital stock from $280,000 to $1,210,000, the purpose of this increase being to erect a branch plant in the South and also to make an extension to its works at Carpentersville. Plans have not yet been fully prepared covering these improvements.

G. H. Cummings, Chicago, is in the market for the following: Second-hand 16-in. two-spindle drill press, one 24-in. drill press, small power punch press and one power hack saw.

Eleven acres of land have been purchased by the Grand Rapids Refrigerator Company, Grand Rapids, Mich., as a site for a new plant, the building of which will be commenced immediately and on which about $100,000 will be expended. Beyond excavating and building the foundation walls the work will not be hastened, but it is expected that the plant will be ready for occupancy next August. Besides the main factory and warehouse, separate buildings will be erected for the enameling plant, dry kilns for drying lumber, storerooms for lumber, oilroom and boiler room. The main factory will be about 64 x 350 ft., having three stories and basement. A wing will be added, 64 x 80 ft. The warehouse will be 125 x 400 ft. About 100 more men will be required when the new plant is in running order, making the total number of employees about 350. The Grand Rapids & Indiana Railroad is already making excavations for two spur tracks to be run to the plant.

The Savill-Chandler Company, Canton, Ill., which has recently incorporated with a capital stock of $30,000, will take over the business of J. M. Savill & Sons, build a new plant and extend the business. Arrangements will be made to manufacture mine cars and mine equipment on a much larger scale than was possible under the old organization, and the company may decide to move to another point with a view to obtaining better shipping facilities and a more central location in relation to the trade. Samuel Savill is president of the company and C. B. Chandler secretary and treasurer.

The Anderson Machine Company, Bedford, Ind., manufacturer of gasoline engines, automobiles and supplies, is in the market for one drill press, one cylinder grinder, two lathes and one 20-hp. gasoline engine for completing the equipment of its plant.

New England Machinery Market.

WORCESTER, MASS., Oct. 16, 1906.

Machinery dealers are hoping to feel some relief from the effects of depleted stocks with the filling of stock orders placed with the manufacturers some time ago. The machine tool builders have been shy of stock orders, making them take secondary place to orders for customers, but there are some in the works. Occasionally a dealer has secured tools on orders which were presumed by the tool builders to be for customers, though these are exceptional instances, all orders from dealers being very carefully scrutinized. But some stock orders have been accepted from time to time, and in not a few instances these will be filled within the next month or six weeks. Their aggregate will not be very large and they will not include all lines of the standard tools. But they amount to something, and with practically bare floors the dealers will welcome anything that will permit them to talk to customers without having to quote deliveries far in the future. Few persons outside of the immediate trade have any idea of how stocks have dwindled during the past few months. An instance is reported from the middle West, illustrating the general condition. A machine tool house had several hundred thousand dollars' worth of machinery in stock when the extreme demand began. To-day there is scarcely $30,000 worth.

San Francisco is literally crying for machinery of all descriptions and is willing to take anything that will serve the purpose of manufacturing, even if it will answer as a makeshift only. Representatives of manufacturers and dealers have been and are in the East visiting manufacturers in the attempt to get every possible advantage in the way of deliveries. There is naturally a friendly feeling toward these men, engendered in the general sympathy with everything pertaining to the unfortunate city, and doubtless these visitors have been given every advantage in the way of opportunity to purchase that is conducive to business methods.

The advance of 5 per cent. on machine tools becomes more general every day. More manufacturers are putting up their prices and new lines are being added to the list. At least two builders of steam hammers have advanced prices 5 per cent. during the past week. The increase in prices of metal planers has extended more generally through the different sizes, which was to be expected in the face of the greater cost of raw materials.

The next two months will be watched closely as bearing upon the permanency of present conditions. The period immediately preceding the New Year is usually attended with a falling off of trade, because business houses are preparing for the annual inventory, which with most of them comes at this time. The temptation under most conditions is to spend the least possible money during the latter part of November and all of December that the cash showing in the annual statement may be as favorable as possible, and the stocks may not seem to be too large. This year, however, the inclination to help along the statement will naturally be less. It will be good enough without assistance, and under existing conditions of business it is costly to put any handicap on production by the postponement of expenditures. Another important period will be that following the New Year, after the large corporations have made their appropriations for improvements. Doubtless when the results of these meetings are announced, or leak out, they will be entirely to the liking of a trade that is now satisfied only with very good figures in the way of proposed expenditures which will affect the market.

The season's increase in manufacturing capacity in all metal lines has been a very important one in New England. There are no figures available upon which to base comparisons with other years, but it is probably true that no previous year has seen a greater actual enlargement in manufacturing facilities, and probably the percentage of increase has quite equaled and perhaps exceeded that of any other corresponding period. The mere item of new building does not begin to tell the whole story. Capacities of many plants have been greatly increased by the utilization of space which had hitherto been idle or devoted to other purposes than actual manufacturing. In not a few instances building operations of other years which were in excess of the requirements of the time have proved to be invaluable assets in providing room for manufacturing. Concerns which had been criticised for too great an optimism at the time enlargements were made have been able to laugh at their critics, as the availability of ready floor space provided means for quickly adding greatly needed facilities of production.

The price of brass and other composition castings has advanced sharply, the increase on brass being 2 cents a pound. In addition to this the brass founders are telling their trade that another advance may be expected, probably of 3 cents a pound, which with the 2 cents already tacked onto the price will constitute an increase of more than 20 per cent.

The Puritan Hygienic Ice Company, Boston, is having plans prepared for a large artificial ice plant to be erected on Albany street, in that city. The estimated cost of the plant is $300,000. Plans are not yet sufficiently advanced for details and no equipment has been decided upon. The plans are in the hands of Kendall, Taylor & Emerson, architects, 93 Federal street, Boston.

The General Electric Company has plans for another addition to its Lynn plant. It will form a part of what are known as the River Works and will be 60 x 132 ft.

It is proposed to consolidate the Robb Engineering Company, Amherst, Nova Scotia, and the Robb-Mumford Boiler Company, South Framingham, Mass. A meeting of the stockholders of the former corporation has been called for October 23, when the matter will come to a vote, and the expectation is that the merging of the two companies will be carried through. The Robb Engineering Company is well known in the Dominion as a builder of boilers and engines, and the Robb-Mumford Company is an offshoot of the company, organized to take care of the business in the United States, manufacturing the same type of boilers, including a patent marine boiler. The business and equipment

of Edward Kendall & Sons, Cambridge, Mass., was purchased about two years ago and a new plant was erected at South Framingham, which is now operating, with large capacity. D. W. Robb is the managing director of both companies. The officers of the Robb-Mumford Boiler Company are: President, D. W. Robb; general manager, F. H. Keyes, and secretary and treasurer, G. W. Cole.

The Skinner Chuck Company, New Britain Conn., has acquired a tract of land containing 1¼ acres adjacent to its property, which will give a considerable additional railroad frontage, and which in connection with land purchased last spring will provide for the future growth of the plant. At the present time a power house, 44 x 71 ft., is being erected, and bins for storing coal and a hardening and tempering room are being arranged in connection with the new building. Other building plans are under consideration, but are not yet ready for announcement.

The Danbury & Bethel Street Railway Company, Danbury, Conn., is to erect a new repair shop in connection with a large car barn which it is planned to build at Danbury.

The firm of Hill, Clarke & Co., Boston, Mass., dealers in machine tools, has been incorporated under Massachusetts laws with capital stock of $200,000. The new name is Hill, Clarke & Co., Incorporated. The officers are: President and treasurer, Charles A. Clarke; clerk, Frank F. Cutting; directors, these officers and E. A. Long. The new corporation has no connection with the Chicago branch of the same name, which was incorporated as a separate business some time ago.

The Simplex Electrical Company, 110 State street, Boston, has purchased a tract of land directly across the street from its present factory in Cambridgeport, and it is understood that a new manufacturing building will be erected on the premises, though no definite plans have been made. The company manufactures electric specialties.

The Valley Falls Iron Foundry, Valley Falls, R. I., has been incorporated in Massachusetts as the Valley Falls Iron Foundry, Incorporated, with capital stock of $10,000, and with William S. McIntire as president and treasurer and Frank W. Delano as clerk. The company manufactures iron castings. No new equipment is required at this time.

Government Purchases.

WASHINGTON, D. C., October 16, 1906.

The Isthmian Canal Commission will receive bids until December 12 for the construction of the Panama Canal. The contract provides that each bidder must undertake the entire work of construction, but no bar will be offered to contractors associating in the undertaking as long as they are legally organized into a single body with which the Government can deal. Bidders without an available capital of $5,000,000 will not be considered, and a certified check for $200,000 is required with each proposal. A bond of $3,000,000 will be required from the successful bidder.

The Isthmian Canal Commission will receive bids until November 13, Circular No. 335, for the following machinery:

Class 1. One 5-yd. dipper dredge, with hoisting and swinging engines, the main engine to be of double cylinder condensing type; independent air and circulating pumps, boilers of sufficient size to furnish steam at 125 lb. working pressure under natural draft, three vertical duplex boilers and bilge pumps, electric light plant to consist of direct connected engine and generator of about 7½ kw. capacity.

Class 2. Twenty-four horizontal tubular boilers, 84 in. x 18 ft.; two duplex piston pattern boiler feed pumps, &c.

Class 3. Two automatic saw grinders.

Class 4. Eighteen hydraulic screw punches, 2-in. gap.

The Bureau of Supplies and Accounts, Navy Department, Washington, will receive bids until November 6 for steam pumps and other supplies for the Southern navy yards.

The Bureau of Supplies and Accounts, Navy Department, Washington, will receive bids until November 13 for generating sets, &c., for the New York, League Island and Puget Sound navy yards.

The Bureau of Supplies and Accounts, Navy Department, Washington, will receive bids until November 13 for the following machine tools for the Portsmouth, Boston, Washington, Norfolk and Pensacola navy yards: Schedule 209, traveling crane; schedule 210, planer, motor driven pumps, 60-ton crane; schedule 211, grinder, drill, lathes, boring and drilling machine, hydraulic press, traveling crane; schedule 212, well pump.

The Bureau of Supplies and Accounts, Navy Department, Washington, will receive bids until October 30 for motors, portable electric drills, pneumatic drills and other supplies for the Eastern navy yards.

The following bids were opened October 9 for supplies for the navy yards:

Bidder 1, Automatic Switch Company, New York; 2, Alliance Machine Company, Alliance, Ohio; 9, Birdsboro Steel Foundry & Machine Company, Birdsboro, Pa.; 14, Brooklyn Forge & Supply Company, New York; 20, George F. Blake Mfg. Company, New York; 21, Becker-Brainard Milling Machine Company, Hyde Park, Mass.; 23, Brown & Sharpe Mfg. Company, Providence, R. I.; 26, Bridgeman Bros. Company, Philadelphia, Pa.; 37, Crocker-Wheeler Company, Ampere, N. J.; 41, Cleveland Crane & Car Company, Wickliffe, Ohio; 42, Chicago Pneumatic Tool Company, New York; 43, Columbus Pneumatic Tool Company, Columbus, Ohio; 44, James Clark, Jr., & Co., Louisville, Ky.; 46, Dietrick & Harvey Machine Company, Baltimore, Md.; 47, Thomas H. Dallett Company, Philadelphia, Pa.; 51, Drew Machinery Agency, Manchester, N. H.; 52, Erie Foundry Company, Erie, Pa.; 54, Walter H. Foster Company, New York; 59, Fairbanks Company, Philadelphia, Pa.; 60, Fairbanks Company, Baltimore, Md.; 65, Garvin Machine Company, New York; 66, General Electric Company, Schenectady, N. Y.; 68, General Pneumatic Tool Company, Montour Falls, N. Y.; 70, R. W. Geldart, New York; 72, Gardner-Governor Company, Quincy, Ill.; 81, Hendy Machine Company, Torrington, Conn.; 82, Handlan-Buck Mfg. Company, St. Louis, Mo.; 86, Hisey-Wolf Machine Company, Cincinnati, Ohio; 87, Holtzer-Cabbott Electric Company, Brookline, Mass.; 88, Ingersoll-Rand Company, New York; 89, Independent Pneumatic Tool Company, Chicago, Ill.; 95, I. H. Johnson, Jr., & Co., Philadelphia, Pa.; 107, Lidgerwood Mfg. Company, New York; 114, Lucas Machine Tool Company, Cleveland, Ohio; 117, Lenbur Engineering Company, New York; 134, Manning, Maxwell & Moore, New York; 139, Niles-Bement-Pond Company, New York; 140, Norfolk Woodworking Machinery Company, Norfolk, Va.; 145, New York Hardware Company, New York; 147, Tinnius Olson & Co., Philadelphia, Pa.; 151, Oliver Machinery Company, Grand Rapids, Mich.; 154, Pratt & Whitney Company, Hartford, Conn.; 155, S. M. Price Machinery Company, Norfolk, Va.; 157, Pawling & Harnischfeger, Milwaukee, Wis.; 158, Prentiss Tool & Supply Company, New York; 160, The Peckham Company, New York; 161, Quincy-Manchester-Sargent Company, Plainfield, N. J.; 163, Ricketts Engineering Company, Washington; 165, Riehle Bros. Testing Machine Company, Philadelphia, Pa.; 166, Ruboil Belting Company, Du Boise, Philadelphia, Pa.; 169, H. A. Rogers, Company, New York; 192, Sherman-Brown-Clements Company, New York; 195, H. B. Smith Machinery Company, Smithfield, N. J.; 197, Sprague Electric Company, New York; 211, Vandyck-Churchill Company, New York; 212, Vermilye & Power, New York; 219, Western Electric Company, New York; 221, John D. Westbrook, Norfolk, Va.; 223, Williams, Browne & Earle, Philadelphia, Pa.; 227, Westinghouse Electric & Mfg. Company, East Pittsburgh, Pa.

Schedule No. 149.

Class 81. One 10-ton three-motor crane—Bidder 2, $3450; 41, $2510; 68, $2760; 134, $3452; 139, $3400 and $2625; 157, $2635.

Class 82. One Olsen spring testing machine—Bidder 147, $390; 165, $450.

Class 83. One Bement slotter—Bidder 60, $2395 and $3975; 134, $2750; 139, $2700; 163, $3300.

Class 84. One Bement motor driven slotting machine—Bidder 60, $2549 and $2575; 134, $2950; 139, $2600; 163, $2250.

Class 85. One universal grinding machine, No. 1½—Bidder 54, $695.

Class 86. One universal and tool grinding machine, No. 13—Bidder 23, $959.80; 60, $799; 82, $300.

Class 87. One No. 3 direct current drop apron tool grinder—Bidder 60, $274; 82, $275; 134, $280; 139, $290.

Class 88. One special roller path grinding machine—Bidder 154, $6280.

Class 89. One belt lacing machine—Bidder 155, $84.75; 166, $85; 221, $95.

Class 90. Two Little Giant drills—Bidder 42, $147; 43, $115; 88, $115.20; 89, $119.50; 163, $434; 221, $143.

Class 91. One portable electrical grinder—Bidder 14, $40; 70, $40; 86, $40; 134, $40; 155, $37.93; 163, $62; 169, $40; 192, $40; 221, $49.50 and $42.

Class 92. One electrically driven three-spindle drill—Bidder 44, $415; 60, $415; 139, $225.

Class 93. Four electrically driven sensitive drills—Bidder 44, $416; 60, $416.

Class 94. One Bickford full universal radial drill—Bidder 60, $2340; 134, $1800; 139, $2035.

Class 95. One horizontal boring and drilling machine—Bidder 60, $2125; 134, $2250; 139, $2140; 158, $1625.

Class 96. One horizontal boring, drilling and milling machine—Bidder 134, $5100; 139, $7735.

Class 97. One horizontal drilling, boring and milling machine—Bidder 46, $5950; 60, $3025; 139, $5775.

Class 98. Two plain milling machines—Bidder 21, $2875; 23, $3517; 60, $3035; 139, $2920.

Class 99. One full universal radial drill press—Bidder 134, $1500; 139, $1475; 163, $1645.

Class 100. One combined folder and brake—Bidder 155, $160; 158, $158.

Class 101. Three pneumatic hammers—Bidder 42, $195;

47, $159; 88, $191.70; 89, $151.50; 163, $167.70; 221, $202.50.

Class 102. One triple geared engine lathe—Bidder 60, $2375 and $3985; 95, $3200; 134, $4600; 139, $3130; 163, $3326.

Class 103. One engine lathe—Bidder 95, $6133; 134, $4750; 139, $6800.

Class 104. One automatic wood turning lathe—Bidder 68, $1195; 151, $1251.

Class 105. One Hendey geared head lathe—Bidder 60, $1350 and $1275; 81, $1050; 134, $1050; 139, $1037; 163, $745 and $720.

Class 106. Two Prentice Bros. high speed lathes and one taper attachment for same—Bidder 59, $1505; 134, $1845; 139, $1567.

Class 108. Three motor driven Flather lathes—Bidder 14, $2668; 134, $2610; 139, $2175 and $2310; 163, $1651; 169, $2655.50; 211, $1930.

Class 109. One Van Norman duplex milling machine—Bidder 134, $910; 158, $908.

Class 110. One power feed triple drum sander—Bidder 140, $1650; 195, $1100.

Class 111. One scroll saw—Bidder 140, $275; 195, $85.

Class 112. One Autenreith's patent parallel swing saw—Bidder 195, $375.

Class 113. One improved Boult's patent edge molder and shaper—Bidder 134, $485.

Class 114. One model foundry cold saw cutting-off machine—Bidder 9, $3703; 60, $2575; 161, $2855; 163, $2740.

Class 115. One self-feed rip saw table—Bidder 140, $650; 169, $584.35; 195, $250; 223, $375.

Class 116. One radius planer attachment—Bidder 134, $85; 155, $78; 158, $75 and $150; 161, $75.

Class 118. One special U. & W. air drill—Bidder 43, $135; 155, $135.

Class 119. Burr machines, turning machines, automatic band saw and filing machine, wiring machine, &c.—Bidder 155, $673.50.

Schedule No. 150.

Class 121. One universal milling machine, complete—Bidder 21, $1900; 139, $1870.

Class 122. One vertical drilling machine—Bidder 134, $80 and $90; 139, $67.65; 158, $78.

Class 123. One universal radial drilling machine—Bidder 134, $1830; 139, $1918; 163, $1650.

Class 124. One horizontal boring and drilling machine—Bidder 114, $3220; 134, $3350; 139, $2820.

Class 125. One vertical boring and turning mill—Bidder 134, $3500; 139, $2625; 158, $2725.

Class 126. One 1000-lb. single frame steam hammer, complete—Bidder 52, $1175; 82, $1105; 134, $1075; 139, $1020; 158, $1140.

Class 127. One pipe cutting and threading machine—Bidder 51, $656; 82, $780; 134, $675; 139, $498; 163, $435.

Class 128. One engine lathe, complete—Bidder 65, $3350; 139, $4290.

Class 129. One engine lathe, back geared, complete—Bidder 65, $1540; 81, $1840; 139, $1995 and $1721.

Class 130. One double angle shearing machine, complete—Bidder 134, $5620; 139, $5935.

Class 131. One slotting machine, complete—Bidder 134, $2950; 139, $2510; 163, $2350.

Class 132. One motor driven screw cutting engine lathe—Bidder 134, $1100; 139, $1224; 163, $800; 211, $1090.

Class 133. One crushing machine—Bidder 223, $282.50 and $387.50.

Class 134. One double cylinder drum hoisting engine, complete—Bidder 107, $1235; 117, $898; 163, $797 and $874; 212, $849; 221, $1235.

Schedule No. 169.

Class 146. One automatic feed pump and receiver, one boiler feed pump and one vacuum gauge—Bidder 20, $143; 72, $180.

Schedule No. 171.

Class 203. One engine lathe—Bidder 60, $145; 139, $150.

Class 206. One lock corner machine—Bidder 151, $955; 212, $950.

Class 213. Five pipe cutters and 76 pipe wrenches—Bidder 26, $99; 60, $88.42; 134, $81.20; 145, $111.67; 169, $84.30.

Schedule No. 172.

Class 263. One electric motor and one 10-hp. starting panel for shunt wound—Bidder 37, $686 and $472; 66, $375; 87, $485; 197, $462; 219, $460; 227, $484.

Class 264. One automatic motor starter—Bidder 1, $108.

Under bids opened September 11 for supplies for the navy yards the Pittsburgh Industrial Iron Works, Pittsburgh, Pa., has been awarded class 6, one 5-ton derrick, six coal tubs and one grab bucket, $3930.

P. H. & F. M. Roots, New York, have been awarded class 18, one air pressure blower, $2305, under opening of September 18 for supplies for the navy yards.

The following awards have been made for machinery for the navy yards, bids for which were opened September 25:

Vandyck-Churchill Company, New York, class 71, one toolroom planer, $476.

Manning, Maxwell & Moore, New York, class 72, one boring and turning mill, $1550.

Warner & Swasey Company, Cleveland, Ohio, class 74, one screw machine, $1300; class 75, one screw machine, $750.

Holtzer-Cabott Electric Company, Brookline, Mass., class 118, one motor generator, $325.

Westinghouse Electric & Mfg. Company, Pittsburgh, Pa., class 181, one 20-hp. electric motor, $383.

Almy Water Tube Boiler Company, Providence, R. I., class 186, one Almy water tube boiler, $885.

Under bids opened October 2 for supplies for the navy yards the J. W. Paxson Company, Philadelphia, Pa., has been awarded class 33, one tumbling barrel, $400; Brooklyn Forge & Supply Company, New York, class 34, two double piston outside pump hydraulic jacks, $378.80.

Trade Publications.

Air Compressors.—The Allis-Chalmers Company, Milwaukee, Wis. Bulletin No. 150. Size 8 x 10½ in.; pages 40. Illustrated. An elaborate treatise on air compressing, with paragraphs on the saving in power by cooling during compression, various plans for taking away the heat during compression, clearance in the compressor cylinders, free air capacity, and initial heating. Conclusions are deduced in regard to essentials to economy in air compression. Other points considered are accessibility of parts, speed regulation, proper lubrication, danger from explosion, &c., with particular reference to features of Allis-Chalmers air compressors. Individual parts, such as cylinders, valve gear, intercoolers, governor, unloading device, &c., are described in detail and tables of sizes, weights and capacities of different designs are given. A number of valuable tables and diagrams are given in the concluding pages for quickly determining data involved in compressed air engineering work.

Electrical Apparatus.—Stanley-G. I. Electric Mfg. Company, Pittsfield, Mass. Two bulletins and two circulars. Bulletin No. 149 is on the subject of polyphase induction motors made in various sizes up to 7½ hp. The novel feature of this motor is that the laminated iron core of the stator is freely exposed to the air around its entire periphery. Bulletin No. 608 superseding No. 419 deals with the G. I. flush-pocket wall receptacle, which is adapted for use with the standard Edison attaching plugs. A round door eliminates the objectionable sharp corners of the old style of receptacle. Circular No. 785 is devoted to the K-9 arc lamp for multiple alternating current circuits, suitable for operation on all of the standard induction motor voltages, namely, 220, 440, 550. Circular No. 778 pertains to circuit breakers versus switches and fuses, and gives prices and lists of the C-7 circuit breakers.

Valve Seats.—Crosby Steam Gage & Valve Company, 16 Dey street, New York City. Circular. Pertains to the Crosby spring seat valve, a description being given of the valve in connection with sectional view illustrations.

The Pittsburgh Foundrymen's Association.—The first meeting of the 1906-07 season of the Pittsburgh Foundrymen's Association was held in the Colonial Annex Hotel in that city on Monday evening, October 8, with a very good attendance. The meeting was preceded by a dinner at which B. D. Fuller, retiring president, acted as toastmaster. A number of interesting addresses were made by W. H. McFadden, president of the American Foundrymen's Association, J. S. Seaman, Seaman-Sleeth Company, S. D. Sleeth, Westinghouse Air Brake Company, D. J. Thomas, Sterritt-Thomas Foundry Company, H. E. Field, Mackintosh, Hemphill & Co. and others. The principal address of the evening was made by Hon. James Francis Burke, Congressman from the Pittsburgh district. Mr. Burke's address was devoted chiefly to showing the greatness of Pittsburgh as a manufacturing center, and he also referred to the fact that the foundrymen by close affiliation and working harmoniously together would accomplish much more good in the trade than in any other way. Mr. Burke's address was very interesting, and he was given a hearty vote of thanks. The annual report of Secretary F. H. Zimmers was read and showed that the membership of the association is steadily increasing. An election of officers was held that resulted as follows:—Henry P. Spilker, Sterritt-Thomas Foundry Company, president; H. E. Field, Mackintosh, Hemphill & Co., vice-president; J. S. Seaman, Seaman-Sleeth Company, treasurer; and F. H. Zimmers, secretary. An executive committee was also elected consisting of W. H. McFadden, S. D. Sleeth, E. A. Kebler, B. D. Fuller and J. S. McCormick.

HARDWARE

IN another column we print a communication from a manufacturer in which he protests against the practice indulged in by some of applying discourteous if not abusive epithets to the catalogue houses, thus carrying on in an undignified manner the controversy in regard to their methods and their disturbance of trade relations. We are confident that our readers generally will second the protest of our correspondent. The spirit of the trade indeed in considering the catalogue house problem has been eminently fair, with a recognition of the strong points of the mail order system and its legitimacy when rightly conducted as a method of marketing goods. When it has cut into a merchant's business as seriously as has been the case in this competition it speaks well for the trade and for those who have conducted the campaign against the catalogue houses that there has been so little of the objectionable practice of calling names to which our correspondent directs attention.

The applying of derogatory epithets and the treating of these troublesome competitors in a discourteous manner is certainly to be regarded with unqualified condemnation, as unworthy the movement in opposition to them, and injuring instead of aiding it in the judgment of fair-minded persons. Let the controversy be carried on vigorously on legitimate lines, making plain the disturbance caused to trade relations, the injury and loss resulting not only to the individual merchants but to the villages and towns throughout the country, the duty of the manufacturers and none the less of the jobbers to be square in their treatment of the problem and not pose as opponents of the mail order business while they are covertly supplying the mail order houses with goods—let these and other considerations be dwelt upon and enforced in straightforward and telling argument, but always without the accompaniment of discourtesy and abuse. Nothing is gained and much is lost by a cause whose advocates have recourse to such methods. The catalogue house business is a sufficiently serious menace to the trade, and, what is more important, to the welfare of the rural communities, to be discussed earnestly rather than flippantly, and to be met with practical effort and enterprise rather than by denouncing and possibly aiding it, by applying objectionable and belittling epithets.

Close observers of trade tendencies have noticed with increasing interest the inception of a movement on the part of manufacturers of finished products to secure a more equitable adjustment of terms of payment on bills of merchandise. This movement shows itself in the recent announcement of several manufacturers of leading lines that their terms on future invoices will be 30 days net, with 1 per cent. discount for cash in 10 days, instead of 60 days with 2 per cent. discount for cash in 10 days, as heretofore. It is too early as yet to discover whether the lead of these important interests will be followed by producers in other lines. The admission must be made by all fair minded persons that the prevailing terms on invoices have been heavily in favor of the purchaser. The cash discount of 2 per cent. represents an exorbitant rate for money and is especially onerous to manufacturers who are obliged to buy their raw material on much closer terms, sometimes net cash, and where a cash discount is allowed find it much smaller than they are called upon to grant to their customers. The established terms, moreover, have been interpreted by buyers, both wholesalers and retailers, with the greatest liberality, the discount often being deducted on remittances made after the stipulated time. Some express the belief that if correction of these abuses alone can be brought about by the present movement the main object of its initiators will be accomplished. The action taken has aroused a vigorous protest on the part of the jobbing trade and it remains to be seen what the outcome will be. The jobbers argue against the change that it seriously disarranges long established conditions of merchandising and that they would be the principal sufferers, as they would be unable at all readily to alter their terms to the retail trade.

Condition of Trade.

There is little danger of exaggerating the prevailing activity in all departments of the Hardware trade. Now that the hight of the season is upon us the steady hum of the great mill of business rises to a roar denoting only too plainly that the machinery is being driven to its utmost capacity. As has already been indicated in these columns the strain is almost entirely in producing and securing goods. Manufacturers first and jobbers in their turn are beset by their trade with demands of the greatest urgency, to which at best they can only give a partial response. The market is noticeable for an almost complete absence of selling pressure and the accompanying arguments, concessions and compromises as to price. A buyer in want of goods feels little disposition to haggle over a quotation or to shop around for better terms, knowing that if he does not place his order to-day he may miss his market and be forced to pay a higher price to-morrow. At the same time it is fair to assume that conservative merchants are not anticipating their requirements to the extent of speculation, fully appreciating that the present level of prices, though not unreasonable, is high and can only be maintained by a continuation of our general prosperity, dependent on successful agricultural seasons, healthy financial conditions and sane and stable administration of national affairs. Already the conditions of the money market, which have long engrossed the attention of financial circles, are making themselves felt in all departments of trade. Grave currency problems are to be discussed by the representatives of our leading banking institutions now convening in a Western city and their conclusions and recommendations will be of primary interest to the entire mercantile world. The attention of the Hardware trade is especially directed to the copper market, which has lately manifested runaway proclivities. Soaring prices for raw material have of course had their effect on the large line of finished products into which copper enters, and quotations can only be made from day to day. These conditions are unfortunate, not only reducing consumption and promoting the use of substitute metals wherever possible, but also creating an unsettled and unhealthy market and increasing the likelihood of a disastrous break in prices when the boom is over and normal conditions are restored. It is greatly to the credit of the powerful interests controlling the steel and iron markets that their stability is not threatened by a situation analogous to that observed in copper at the present time.

Chicago.

Weather conditions throughout this section during the past 10 days have had a stimulating effect on the Hardware trade and jobbers and distributers have been in receipt of insistent demands for the quick shipment of winter goods. Retailers report heavy sales of Stoves, including Ranges and Cooks as well as Heaters, and numerous filling-in orders for such accessories as Elbows, Stove Pipe and Boards are being received by the jobbing trade. The quickened demand during the past week has placed the totals thus far this month on a par with the same period in September, and a record month, notwithstanding heavy sales earlier in the season, is looked for by several of the local jobbers. There has been no halt in the upward movement of values and with premiums prevailing on most lines of raw material that are used in Hardware manufacture further advances are anticipated. While Builders' Hardware has kept pace with the general market and is now on a higher basis than at any time in recent years, Strap and T-Hinges are on a basis that barely pay the cost of manufacture. The increased cost of material has not apparently yet been considered by these makers, and their operations on this line for the year will show, it is said, rather meager profits. Delayed deliveries of sheets and cold rolled stock are interfering with manufacturing operations to such an extent that shipments of many finished goods are deferred from two to three months. Chicago building figures for September show an increase in the number of structures, but a material falling off in feet frontage. The reason for this state of affairs is the stimulated construction of dwellings and two-flat buildings by people of small or moderate means. Heretofore the totals have been swelled by large apartment houses built by speculative builders. This class of construction has always been an important factor in Chicago, and while still very active is to some extent being eclipsed at the present time by the smaller structures. Permits were issued during September for the construction of 1085 buildings, involving an aggregate cost of $4,579,200, against 1003 buildings, and a cost of $7,349,150 last year, a gain of 82 buildings and a decrease of $2,769,950 in cost.

St. Louis.

NORVELL-SHAPLEIGH HARDWARE COMPANY.—Tornadoes, storms, rains and floods have had their effect upon business. Then we hear of the bad effects of early frost. Many of our salesmen write us, however, that conditions are not as bad as reported in the press. The recent cold snap has stimulated business on Stoves, Stove goods and winter lines.

The mail or open orders sent direct by customers are unusually numerous. Orders of this class of course are not generally large; they represent either some special item ordered for the retailer's customer or a pressing order for staple goods to fill up stock caused by an unexpected and unusual retail demand.

A mail order demand can of course be stimulated to some extent by issuing seasonable catalogues. These books and the postage on them are very expensive. Results in the way of orders are not always what might be anticipated. Recently we issued a fall catalogue with some very attractive goods and prices. We sent out a large number of them. Naturally we received many mail orders from this book. It must be admitted, however, that the greater returns from this book came in the form of orders from our own salesmen sold from the catalogue itself.

In these days when so much is said about getting business by mail some of us may be inclined to look so hard at one side of the shield that we may forget what is written on the other. We have many letters from our salesmen about our fall catalogue, and frankness compels me to say these salesmen write the retail trade is receiving so many circulars and catalogues that most of them are promptly, without investigation, consigned to the wastebasket. A number of our salesmen have written our fall catalogue has remained unused on a customer's desk. When, however, the salesman turned through the pages of the catalogue with the customer and called his atten-

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tion to goods and prices he showed his appreciation by placing an order.

Every jobber who looks over the work of his salesmen must realize that the strength and personality of the salesman are an undiminishing factor in securing business. Any of us can look over the work of our salesmen in a certain State—probably territories of equal strength, crop conditions alike, the same jobbing house, the same catalogue, the same samples, the same prices, the same service—but what a difference in the results of the different salesmen! This difference is simply one of the attractiveness of the salesman, of his energy and his ability.

These facts, that are so apparent to all jobbers, are somewhat consoling and comforting when we consider the mail order problem, and also when it is threatened the manufacturer will go direct to the retail trade. When a manufacturer decides to do this and will take up the problem of the traveling salesman on a large scale, he will realize a few things that are now possibly only fully appreciated by the jobbers.

He will find each really successful salesman represents probably the labor, the lost time and the vanished hopes of his house with nine others. In other words experience teaches that about one first-class salesman develops out of 10 experiments. This may also be said in a measure of heads of departments and buyers in the house.

Therefore the organization of a successful Hardware jobbing house to-day represents much labor, much experience and much loss in the organizing. The best organization and the best system are the result of development. Development along right lines means "the survival of the fittest"; it also means the elimination of the unfit. Development takes time, labor and it costs a great deal of money.

When you hear talk of selling the retail trade by catalogues or manufacturers going to the medium sized and small retailers and seeking their business direct don't worry—the retail dealer wants the jobber, he also wants the jobber's salesman, and he is willing to pay for what he wants.

Portland, Oregon.

FAILING, HAINES & MCCALMAN.—This is a wonderful season in the Northwest. With the exception of one or two small sections wheat has been abundant and all other crops, especially small fruits, have been wonderfully successful. With all this crop money in circulation it will be the fault of the jobbers themselves if this is not the most prosperous year in the history of this territory. The population of the territory is rapidly increasing with accessions from the East and the Middle West. Almost all of these new settlers have money and have been successful in their old homes. Building all through the Pacific Northwest is continuing at an unexampled rate and promises to do so indefinitely. In fact, every condition promises a continuance of the present good times, and not even the Congressional elections or any other disturbing influence seems to interfere with business.

Nashville.

GRAY & DUDLEY HARDWARE COMPANY.—After about six weeks of almost continued rain we at last have enjoyed a week of sunshine, and we are glad to say that the effect of the latter upon crops and business has been almost magical. The rains, which continued so long and which in some sections amounted almost to a flood, damaged very materially the growing and maturing crops. Before the cessation of rain we were receiving most gloomy reports, both from traveling men and customers throughout the South, particularly in Mississippi, Louisiana, southern Alabama and some parts of Georgia. These reports in many instances of course were very much exaggerated, claiming a deterioration which varied all the way from 5 to 75 per cent in the growing crops, but we are glad to say that since the sun began to shine again our friends engaged in agriculture realize that their estimates of the loss by rain has been very much magnified. While the southern country east of the Mississippi River will sustain a very considerable loss, yet it will not amount to anything like what it looked when the rain was falling.

Notwithstanding these gloomy reports we are pleased to advise that business has continued good and we are enjoying now as fine trade as we have ever had at this season of the year, and we have no doubt that more than an average crop will be gathered, the greatest loss perhaps being in the quality of the corn and cotton, which will necessarily be damaged by the wet weather. The advance in the price of cotton will go a long way toward recuperating the loss thus sustained. Taking it altogether we do not think that the great wave of prosperity has been checked at all and we look for a continued good business. Collections are about as usual at this season of the year.

Philadelphia.

SUPPLEE HARDWARE COMPANY.—Trade continues good, with no reduction in either the number of orders or volume since our last letter to *The Iron Age*. Fortunately the jobbers have been able to fill general orders sufficiently promptly to satisfy their customers, although it has been a great effort on the part of some manufacturers to promptly supply the demands for goods made upon them, and on some kinds of goods greatly in demand there is naturally some delay at times in making shipments.

Everything indicates a continuation of trade and prosperity, not only in the Hardware line, but in almost all kinds of goods manufactured in the United States, and manufacturers report that a greater amount of money is required to enable them to extend their business. This also is naturally the case with both the jobbing trade and retail merchants, largely owing to the increase of trade, and in many instances is the cause of unusually slow collections during the past few months from some of the retail merchants.

To overcome this additional use of money we infer is the reason why a few of the manufacturers have issued circulars making their terms 30 instead of 60 days. We feel this has been done without due consideration of the unfortunate effect it must have upon trade. It would be impossible to name the many disadvantages of this change in a short letter, but we will say that with all the excuses or reasons yet named to us we feel not one of the manufacturers could have sufficiently considered before he made the change or demand upon their customers.

During the present week will be held meetings of both the National Hardware Association of the United States and the American Hardware Manufacturers' Association, and doubtless matters of interest and importance to both will come before the conventions.

Louisville.

BELKNAP HARDWARE & MFG. COMPANY.—The market it strong and active, as it seems to be all over the country. Clear weather has succeeded the rains and wind storms which devastated the Southern States a week or two ago. Irretrievable damage was done, though, in the comparatively short time—cotton rendered rank, corn sprouted in the shocks or in the fields where it had been left to dry. Tobacco has been through all the gyrations of undesirable performances in sweating, molding, wilting under the late freeze, but with all this there still seems to be plenty in most quarters. The bull arguments prevail and prices are well maintained.

We must remember, on the contrary, that we have gotten through the summer without any serious widespread floods or droughts. There has been no yellow fever in the Southern country or epidemic of any kind; labor has been abundantly well employed and able pretty much to fix its own terms. The shortage of labor, both domestic, agricultural and mechanical, is very manifest, particularly to one who is engaged in any considerable undertaking. This state of affairs is amply borne out by the columns of the newspapers, swollen with demands for help, from cash boys up to the higher branches of skilled labor.

If we are going to dig the Panama Canal with Chinese labor why not modify our immigration restrictions and let the Celestials in to peel our sweet potatoes and cook

our coon and 'possum. They wash our clothes, to be sure, if we choose to patronize their laundries, and there is no reason why they should not be doing our other domestic and farm work. We are certainly very short of help and believe we have the wherewithal to pay fair wages. Maybe we shall be better off if we do more of our own work than we have heretofore. It may possibly be that the Hardware fraternity will have to dispense with its individual valets and chefs and get down to buttoning its own suspenders. The desirability of this as a flesh reducer might be considered from an official standpoint at the national convention.

Cleveland.

THE W. BINGHAM COMPANY.—Fortunate is the dealer who has taken our advice in the last six months and bought freely of Hardware, especially in the shelf goods line. Sheet Copper has advanced to 27 cents a pound, Ingot Copper from 22 to 23 cents a pound, Pig Tin to 43¼ cents and other metals in like proportion. There is no surplus of these commodities and the production is consumed as fast as it is turned out. Labor being actively engaged and at good wages, with unprecedented crops throughout the land, all of these conditions portend higher prices. We should all be thankful that the manufacturers of this country have exercised such good judgment and have not become stampeded and advanced prices abnormally from time to time, but have been conservative in holding prices on an even keel as long as they possibly could, considering the cost of materials they had on hand to work up.

The Hardware trade in this section is exceedingly good. Orders are coming in by mail and through salesmen very freely, and everybody seems to be in a hurry and wants to be waited on first. Customers must be a little patient. On account of the immense lines of goods that the Hardware jobbers handle it makes it difficult oftentimes to be as prompt in shipping as one would like. We have to rely upon the promise of the manufacturers on goods that we ordered months ago. Then, too, we are confronted with the car shortage and the large amount of material that is in transit. Transportation companies are crowded and overworked in every department. Of course there is a large amount of goods in the country in the hands of the jobbers and they are doing all they can to make prompt shipment. If dealers would anticipate their wants further in advance there would not be so much complaint about slow shipments of goods ordered.

Strap and T and Screw and Strap Hinges, Harrow Teeth, Barn Door Hangers and Track, Carriage, Machine and Tire Bolts, Lag Screws, Shovels, Spades, Scoops, Files, Axes, Hammers and Hatchets, Brass, Malleable and Cast Fittings and many other kindred goods in the Hardware line are cheap at present prices. No dealer could go very far astray in buying his wants now and taking the goods into stock as soon as he can get them, rather than waiting until he is in pressing need of them and then being disappointed about shipment.

NOTES ON PRICES.

Wire Nails.—Somewhat of a falling off in current business is reported, but the demand compares favorably with that of last month. Specifications on contract orders are coming in freely and mills are still behind orders. An increased production during the present month is regarded as a solution for conditions if cars can be obtained for shipping goods. Steel is still scarce and is interfering with production, and the high price causes some of the mills that buy their Steel to ask a slight premium in the price of Nails. Quotations are as follows, f.o.b. Pittsburgh, plus actual freight to point of delivery, 60 days, or 2 per cent. discount for cash in 10 days:

Carloads, to jobbers	$1.85
Carload lots to retail merchants	1.90

New York.—The demand continues, with little variation, in the same volume as for the past two weeks. The outgo of Nails from jobbing houses is continuous and in fair sized lots. A very general quotation on small lots at store is on the basis of $2.05 per keg.

Chicago.—A heavy increase in the production of Nails will be made by all of the mills during the current month and a big improvement in the shipment of material to distributers and consumers has already been noted. While there has been a slight falling off in the demand, nevertheless the tonnage placed thus far this month, while not as large as that closed during the same period in September, compares favorably with it. Quotations on the present official basis are being well maintained, and in a few instances premiums are being secured on certain sizes which can be delivered promptly. Official quotations, which are being firmly maintained, are as follows: $2 in car lots to jobbers and $2.05 in car lots to retailers, with an advance of 5 cents for less than car lots from mills.

Pittsburgh.—New orders being placed for Wire Nails show a slight falling off since the recent advance in prices was made, but a good volume of new business is being placed with the mills, while specifications on contracts are coming in very freely. Mill shipments are still from three to four weeks behind, and owing to shortage in cars and scarcity of Steel, the mills are not catching up on deliveries to any extent. The continued scarcity and higher prices of Steel are put forth as reasons for another advance in prices of Wire Nails, which may take place before long. Shipments by the mills are heavy, but would be larger if cars could be obtained promptly and the supply of Steel was better. It is stated that some of the independent mills that buy Rods and Billets in the open market are asking slight premiums in prices for prompt deliveries of Wire Nails. We quote: Wire Nails, $1.85 in carloads to the large jobbing trade, and $1.90 in carloads to retail merchants, f.o.b. Pittsburgh, plus actual freight to point of delivery, terms 60 days, less 2 per cent. off for cash in 10 days. The above prices are now absolute minimum of the market.

Cut Nails.—The demand is urgent, but shortage of cars and scarcity of Steel are interfering with shipments from mill, which are considerably behind orders. It is reported that some mills are quoting Nails at an advance on official prices of 5 to 10 cents per keg. Quotations are as follows, f.o.b. Pittsburgh: Carload lots, to jobbers, $1.90; less than carloads, to jobbers, $1.95; less than carloads, to retailers, $2.05. Iron Cut Nails at points west of Buffalo and Pittsburgh are held at 5 and 10 cents advance on Steel Cut Nails.

New York.—Jobbers complain that their stocks are broken, so that they are unable to supply their customers' wants. Manufacturers, in some instances, have been so far behind shipments that they have been cutting down orders for the sizes most in demand, sometimes as much as 50 per cent. or more. This has kept jobbers' stocks in a depleted condition. Manufacturers are promising better service for the future. A very general quotation on small lots at store is on the basis of $2.05 per keg.

Chicago.—Local distributors are greatly handicapped by their inability to get shipments from mills, and the increasing urgent demand serves further to complicate the situation. Specifications on contracts are very heavy. Quotations prevail as follows: Steel Cut Nails, in car lots, $1.95 to $2; less than car lots, $2.05; Iron Cut Nails, $2.05 to $2.10, in car lots; less than car lots, $2.15.

Pittsburgh.—Shipments by the mills are still interfered with by shortage in Steel and scarcity of cars. The demand is urgent and most of the Cut Nail mills are two to three weeks or longer behind in deliveries. Mills in the Wheeling District are understood to be quoting on the basis of $1.95 to $2, at mill. Stocks held by jobbers and at the mills are very light. Prices are firm, and we quote as follows, f.o.b. Pittsburgh. Carload lots, to jobbers, $1.90; less than carloads, to jobbers, $1.95; less than carloads, to retailers, $2.05. Iron Cut Nails at points west of Buffalo and Pittsburgh are held at 5 and 10 cents advance on Steel Cut Nails.

Barb Wire.—Mills are busy filling specifications on contracts, and are catching up with their orders. The

Fall business promises to be unusually heavy in this line. Prices are being maintained. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

	Painted.	Gal.
Jobbers, carload lots	$2.00	$2.30
Retailers, carload lots	2.05	2.35
Retailers, less than carload lots	2.15	2.45

Chicago.—Practically all of the mills are now in position to make prompt deliveries and the leading interest has succeeded in accumulating a small stock. The demand, however, continues unusually heavy for the fall season and the total sales for September and October are unprecedentedly heavy. Prices, which are firmly maintained, as are follows: To jobbers, Chicago, car lots, Painted, $2.15; Galvanized, $2.45; to retailers, car lots, Painted, $2.20; Galvanized, $2.50; retailers, less than car lots, Painted, $2.30; Galvanized, $2.60; Staples, Bright, in car lots, $2.10; Galvanized, $2.40; car lots to retailers, 10 cents extra, with an additional 5 cents for less than car lots.

Pittsburgh.—Specifications on contracts placed by the large trade before the recent advance in prices are coming in very freely, so that the mills are unable to accumulate stocks and are somewhat behind in deliveries. The output is being restricted owing to scarcity of cars and shortage in supply of Steel. Prices are firmly maintained as follows: Painted Barb Wire, $2.30, and Galvanized $2.30, in carload lots to the large jobbing trade, with the usual advance of $1 a ton to retailers in carload lots, f.o.b. Pittsburgh, 60 days, or 2 per cent. off for cash in 10 days.

Smooth Fence Wire.—Manufacturers are behind on their orders, shipments being less heavy on account of the shortage of Steel and cars. For prompt delivery, some of the smaller mills are reported as asking a small advance on official quotations. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

Jobbers, carloads	$1.70
Retailers, carloads	1.75

The foregoing prices are for base numbers, 6 to 9. The other numbers of Plain and Galvanized Wire take the usual advances, as follows:

	6 to 9	10	11	12&12½	13	14	15	16
Annealed	Base.	$0.05	.10	.15	.25	.35	.45	.55
Galvanized	$0.30	.35	.40	.45	.55	.65	1.05	1.15

Chicago.—Specifications on all grades of Wire for manufacturing purposes still continue in excess of production and deliveries are delayed from three to five weeks. Fence manufacturers are unable to secure sufficient material to meet their requirements and are from four to six weeks behind their orders. Prices are being well maintained, as follows: Jobbers, $1.85, f.o.b., Chicago, in car lots; retailers, $1.90.

Pittsburgh.—A fair amount of new tonnage is being received by the mills, but the large trade is specifying very freely on contracts placed with the mills before the recent advance in prices was made. A good deal of tonnage has been booked by the mills for delivery in next year, and while shipments are fairly heavy they would be much larger were it not for the difficulty in getting cars and the shortage in steel. We are advised that official prices are being rigidly adhered to, and that some of the small independent mills are asking slight premiums for prompt deliveries. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

Jobbers, carloads	$1.70
Retailers, carloads	1.75

The above prices are for base numbers, 6 to 9.

Copper Products.—The market for Copper, Brass, Bronze and kindred materials is still an advancing one, with no apparent indications of pause. Some interests are marketing this class of metals absolutely without guarantees, applying on all business, both where specifications are promptly given and where orders are accepted for future delivery. The raw Copper situation is referred to in the trade as unprecedented, mills being obliged to buy their material at present high prices without guarantee, which condition is passed along to the dealer, who is advised that all orders will be taken only at a firm price and whether the market advances or declines the customer will be expected to settle precisely according to contract—namely, take the goods at the agreed price, while the maker will deliver at the price agreed on. The following prices reflect the market mainly on shipments from stock in average quantities, with concessions for mill shipments and for large orders: Sheet Brass, 3 per cent. discount from list; Brass Wire, net list; Brass Rods, 10 per cent. discount; Brazed Brass Tubes, 17½ per cent. discount; Brazed Copper Tubes, 12½ per cent. discount; Soft Copper Wire, net list; Sheet Copper, 27 cents per pound, base; Seamless Brass Tubes, 25 cents, base; Seamless Copper Tubes, 29 cents, base, per pound; Tobin Bronze Rods, 23 cents, base, in round lots; Soldering Coppers, 26 cents per pound, 300 lb. and upward; lots of 100 to 300 lb., ½ cent extra, and less than 100 lb., 2 cents per pound extra.

Casters.—A noticeable stiffening in the price of Casters is evidenced by quotations of some manufacturers. It is generally believed that a positive advance in this line may be expected.

Oakum.—Inquirers for plumber's Oakum are impressed by the firmness of the market, which shows a tendency toward higher prices.

Dividers and Callipers.—The advance made some weeks ago by certain manufacturers of Dividers and Callipers has been followed by a further advance of about 10 per cent.

Ice Cream Freezers.—After a conference of leading manufacturers of Ice Cream Freezers, last season's prices were reaffirmed for the coming year. Producers state that there is every prospect for a continuance of the record-breaking demand and jobbers are evincing a willingness to place liberal contracts.

Pike Mfg. Company.—It is announced by the Pike Mfg. Company, Pike, N. H., that a change has been made in the list prices of its India Oilstones. Previously the list on fine grade stones has been somewhat higher than on coarse and medium. They are now made identical, but with slight advances in a few sizes. The company has also adopted a new price-list on German Water Hones, necessitating a rearrangement of discounts which it is believed will better serve the convenience of the trade.

Auger Bits.—Increasing firmness is observed in the market for common Auger Bits. So far as can be learned, all manufacturers have withdrawn price concessions recently made and many producers are said to be soliciting no orders, being more than occupied in handling the business offered them. Conditions are such that it is said an advance in prices would not only be fully justified, but could be easily maintained.

Galvanized Pails and Tubs.—The strength of the sheet metal market has been reflected in several recent advances in various lines of Galvanized Ware. A further advance of about 5 per cent. in Galvanized Pails and Tubs has been noted this week in the quotations of leading manufacturers.

Conductor Pipe and Eave Trough.—Following the recent sharp advances in copper to 25 and then to 27 cents per pound, manufacturers have twice raised their prices on Copper Conductor Pipe and Eave Trough within the past few days. The present schedule of discounts on these goods in the various territorial districts is given below:

	Discount.
Eastern Territory	30, 10 and 2½ %
Central Territory	30 and 10 %
Western Territory	30 and 7½ %
Southern Territory	30 and 7½ %
Southwestern Territory	30 and 5 %

Asbestos.—Nominally, prices on Asbestos are unchanged, except as manufacturers of prominence crowded with orders will accept new obligations only at advances, Millboard being quoted variously at 3 cents per pound up to 5 cents, according to the congested state of order books. Asbestos Paper is in the same category, 3 cents per pound

in car loads and 3¼ cents in less than carloads, while some quote 4 to 5 cents per pound. Rope and Wick Packings seem to be fairly steady at the old prices of 17 cents per pound in quantities of 500 pounds and over and 22 cents for less than 500 pounds. Pipe Coverings are about on the same level as for years past. One difficulty in the situation that manufacturers of Asbestos materials are contending with is the increasing difficulty of getting adequate supplies of the fiber from the mines.

Rope.—The business being done by manufacturers is of good volume, with a favorable outlook for a continuance of trade. New York quotations on Rope are as follows: Pure Manila, 12¼ to 12½ cents; B quality, 11½ cents; Pure Sisal, 9 cents; No. 2 quality, 7½ to 7¾ cents; No. 1 June, ¼ in. and up, 8 to 8¼ cents; No. 2 Jute, 7½ to 7¾ cents per pound.

Window Glass.—As the result of the meeting held by Window Glass Manufacturers last week an agreement to the selling agency plan has been signed by manufacturers representing about 2200 pots. The National Brokerage Company will distribute the Glass made by the combined factories on a commission basis, according to the present plan. It is thought that the payment of the guarantee money, $100 per pot, and other formalities will delay the commencement of active operations by the Brokerage Company, possibly two weeks. If the plans are consumated and continued in accordance with the proposed arrangement it will insure a profitable fire for the manufacturers. Recent quotations are reported as being as low as 90 and 10 and 5 per cent. on single strength and 90 and 20 per cent. discount on double strength Glass from some quarters. Quotations of this kind are not expected to continue after the contemplated arrangement is in force. Jobbers' quotations, from jobbers' list, October 1, 1903, are as follows: Greater New York, single, 90 and 5; double, 90 and 10 per cent. discount. Eastern District, except the Boston District, 90 and 10 per cent. discount for all sizes of single and double strength. In the Boston District quotations are reported as being 90 and 15 for all sizes of single and double strength.

Linseed Oil.—The demand for Oil is steady, but for limited quantities. The seed market has been well maintained, with small fluctuations in price, up and down, which has sustained the price of Oil. According to reports, receipts of seed have not thus far been in excess of demand, which is apt to be the case during September and the early part of October. The quantity of seed coming on the market from this time forward usually is in increased volume, and if this proves to be the case the price of Oil may ease off. The lowest price quoted for either large or small lots is on the basis of 37 cents per gallon for out of town Raw. New York quotations are as follows, according to quality and seller: City Raw, 38 to 39 cents per gallon. Out of town Raw, 37 to 38 cents per gallon. Boiled Oil is 1 to 2 cents per gallon over Raw.

Spirits Turpentine.—During the week Turpentine advanced 2 cents per gallon and then dropped off ¼ cent in this market, in sympathy with Savannah fluctuations. Demand has been comparatively light under these conditions, but the market at this point is firm. New York quotations are as follows, according to quantity: Oil Barrels, 67½ to 68 cents; Machine Made Barrels, 68 to 68½ cents per gallon.

Elbows and Shoes.—The harmony which has existed for some time among manufacturers of Elbows and Shoes has abruptly terminated. Competition has become unusually severe and prices are marked by great irregularity. In view of the conditions it is hardly possible to give quotations that will fairly represent the market.

BUELL & MITCHELL, 120 Liberty street, New York, have been appointed New York representatives for the Scaife Water Filters, manufactured by the Wm. B. Scaife & Sons Company, Pittsburgh, Pa. A large display room will be maintained, showing the various styles and sizes of these Filters in actual operation.

DEATH OF HENRY C. SQUIRES.

HENRY C. SQUIRES, of Henry C. Squires & Son, 44 Cortlandt street, New York, died suddenly of heart failure on Monday, October 15. Mr. Squires had been apparently in his usual good health, having attended a family reunion but two days before.

Mr. Squires was born in Binghamton, N. Y., May 13, 1838, and started in business in New York in 1871 as a partner in the firm of Smith & Squires, in Chatham street, now Park Row, nearly opposite the entrance to the Brooklyn Bridge. Later he moved to 1 Cortlandt street, in the Benedict Building, where he remained 12 years as Henry C. Squires, going thence to 178 Broadway, opposite, where he continued for 10 years, when the business was moved to 20 Cortlandt street, in May, 1892, and from there recently to the present address, where the entire building has been taken. In January, 1892, Mr. Squires took his son, G. Harry Squires, into partnership, who will continue the business. The house always kept a high grade of material, and for over 30 years has represented as exclusive agents in the United States the well known house of W. W. Greener, London, England, which manufactures Shotguns, Rifles, Pistols, &c., of the finest quality.

Mr. Squires was very religiously inclined and devoted much time to a large Mission Chapel in Plainfield, N. J., where he lived. He was the founder of the chapel and its superintendent for over 10 years, it finally outgrowing in numbers the home church, which itself was one of the largest in the State.

Correspondence.

DISCOURTESY IN THE CATALOGUE HOUSE DISCUSSION.

To the Editor: For some time we have noted the term "Cat House" applied to retail catalogue houses, and we believe it is beneath the dignity of the Hardware merchants of this country to resort to mud slinging in trying to help them in their fight against this most aggravating competition.

It is good business to show up their methods, when faulty; their description of goods if misleading, the quality of their goods when inferior, such as watered Paints, &c., but when the Hardware merchant lowers himself to calling names it reflects on him more than on the catalogue house.

It is not argument; it convinces disinterested parties of nothing except that the user is vulgar and belittles him in the estimation of all. Two bullies in a brawl would use profane and vulgar language in denouncing each other and the public would form their opinion of them accordingly, and it is certainly most discreditable to the Hardware merchant to emulate the barroom loafer.

Nothing can be gained by simply calling names, and the more vile the term the more inclined one is to "size up" the user.

A MANUFACTURER.

THE NEW YORK CORDAGE COMPANY, 83-89 Wall street, New York, is now furnishing a special made Italian Rope for balloon purposes, and for which it has received orders from prominent aeronauts in this country. This Rope is all specially hand spun of the finest Italian fiber and laid up with the utmost care, so as to produce the greatest possible tensile strength and the least possible weight of Rope, and can be furnished in any size from 3-32 in. up. It has been the custom of American aeronauts either to have their balloons built abroad or to import the Rope. This high class of Rope is now furnished by the New York Cordage Company at a considerable saving in cost over the foreign Rope.

THE CONTINENTAL CORDAGE COMPANY, 93 Wall street, New York, has recently increased its traveling force by the addition of John W. Braid of Baltimore and George R. Fishburne of Charleston. The former visits the trade in New York while the latter travels from this city to Atlanta, Ga.

THE ATLANTIC CITY CONVENTIONS.

(By Telegraph.)

WHILE the two great associations of the trade, the National Hardware Association, representing jobbing interests, and the American Hardware Manufacturers' Association, representing the makers of Hardware, meet in strictly separate conventions, they are brought very closely together, as there is constant intercourse between the members, with joint sessions to which both divisions of the trade are invited and social functions in which all unite. From the importance of the interests concerned the gathering is one of especial significance and at the same time a very enjoyable occasion, as men having business relations with one another are brought into personal contact under very pleasant auspices.

Early this week the corridors of the Marlborough-Blenheim at Atlantic City gave evidence of the interest taken in the conventions, as an unusual number of merchants and manufacturers were in attendance. Among these were many of the officials of both associations, who were present to attend executive meetings, to complete arrangements for the conventions and give some final touches to the programmes, which were, however, substantially prepared in advance. An interesting feature on Tuesday afternoon was the arrival of the Chicago special, bringing a large number of delegates from the West. This train was under the special care of W. H. Bennett, who is so widely and pleasantly known by the trade.

Meeting of Tin Plate and Metal Merchants.

According to previous announcement the tin plate and metal merchants of the United States met in executive session at 10.30 a.m. on Tuesday. P. R. Jennings of Bruce & Cook, New York City, called the meeting to order, and was unanimously selected to act as chairman. A. J. Cohen of the Merchant & Evans Company, Philadelphia, acted as secretary.

Mr. Jennings stated that the meeting was called for the purpose of discussing the affairs of the dealers in Tin Plate and kindred metals and their relations with manufacturers of these products. The points discussed were enumerated under various heads and considered separately, and resolutions were adopted expressing the combined sentiment of the meeting thereon.

These resolutions were referred to a special committee, consisting of P. E. Strauss of Fitz, Dana & Co., Boston; Henry Reese of E. L. Parker & Co., Baltimore; P. R. Jennings of Bruce & Cook, New York; Geo. T. McIntosh of the McIntosh Hardware Corporation, Cleveland, and A. J. Cohen of the Merchant & Evans Company, Philadelphia, who were instructed to consider the resolutions as prepared and confer with the manufacturers of Tin Plate and metals, with the object of bringing about the improvements suggested in the resolutions as to the conduct of that business by manufacturers and jobbers.

The meeting reconvened in the afternoon and the subject was further discussed. At a session on Tuesday evening Theo. A. Gessler of New York and W. J. Wetstein of St. Louis, representatives of the American Sheet & Tin Plate Company, addressed the delegates.

Opening Session of the Hardware Jobbers.

The convention of the National Hardware Association was formally opened on Wednesday morning. This was an open session, and manufacturers and all interested were invited. After the opening exercises, in which a happy address was made by W. S. Wright, president of the association, addresses were made by representatives of the Canadian Wholesale Hardware Association and by President Bush and Secretary Corey of the National Retail Hardware Association. To these, more extended reference will be made in our next issue. Mr. Wright also delivered his annual presidential address and T. James Fernley his report as secretary-treasurer, both of which are given below.

W. S. WRIGHT'S PRESIDENTIAL ADDRESS.

The twelfth annual meeting of this association brings us together under circumstances that should make us grateful to the Giver of All Good and to a capable and wise Administration that we live in so favored a land. From the shores of the Atlantic on which we are gathered, to the Pacific, and from the Gulf to the northern boundary of our territory peace and prosperity are well nigh universal. The generous returns from the soil and the high prices that are secured have given every man who desires to work steady and profitable employment. The distributers have certainly had most favorable opportunities for the employment of their energies and capital, and as for the manufacturers, those of you who placed your orders from 3 to 12 months ago and are still pleading for shipment are as well aware of their trials and sufferings as I am and perhaps better qualified to make due allowance for their unfortunate condition.

Transportation.

Since we last met Congress has at the suggestion of that greatest of all statesmen, Theodore Roosevelt, enacted a law governing transportation to secure equal rights and privileges to all shippers, and our hope is that this law may be so wisely construed and administered as to meet the fullest expectation of its originator. The delays in transportation are a source of serious inconvenience and loss that are as expensive as they are unnecessary, and I recommend for your careful consideration the matter of a reciprocal demurrage proposition that will penalize the transportation companies for undue delay in deliveries on the same basis that we are held responsible for delay in releasing their cars.

National Retail Association

Our relations with the National Retail Hardware Association have been most cordial, and in the great work they have undertaken and on which they have made most gratifying progress we have been of some assistance to them, and they have given us material and valuable assistance in broadening the scope of our work and pushing it forward, for which we are grateful and hope that the pleasant relations now existing may continue and increase, to the advantage of both associations and their members, as well as the trade at large. We are pleased to be able to welcome the president and secretary of the organization, whose counsel and good will we greatly esteem.

Our Relations With Manufacturers

have closely followed the constitution of the association, which says: "The purpose of this association shall be the promotion of more cordial and pleasant business relations with each other and with the manufacturers." And in our dealings with our manufacturing friends we have been met with a broad, generous and fair spirit that has been pleasant and advantageous to both. We must not overlook the fact that these questions have two sides. The manufacturer, like the jobber, has grave and difficult problems to solve, and that many of the questions like legislation must in the very nature of things result in a compromise is self-evident, but if the question at issue is fairly met, with a disposition on both sides to be considerate of the other's interest, as well as conservative of his own, the result is a broader view of the situation on both sides and an appreciation of the difficulties of the other that was not recognized before. But it must not be overlooked that the manufacturer who fails to consider the interest of the distributer and protect it will in time find himself in the position of the man referred to in the good book who built his house upon the sand.

Our Committees

have during the year most diligently and faithfully supported the officers of the association and I want to thank them for their courtesy and consideration. It would undoubtedly be for the interest of the association if more of our work could be done through committees, but when you consider that the members are busy men and have all more detail work to attend to than their time will permit it is unfair to make this work a burden.

The Catalogue House Question

has been most ably handled by the Joint Committee. While I regret to say there has been some criticism and not all outside our membership, this editorial utterance from *The Iron Age* should be echoed by each member of this association: "In this connection it is apropos to refer to the latest catalogue of one of the largest mail order houses, which is a fitting tribute to the faithful and untiring efforts of the Joint Catalogue House Committee." "The absence of many Hardware manufacturers that appeared in previous issues proclaims the successful effort of this body, which has been pursued in a manner that merits the approbation of all affiliated with the Hardware trade."

I believe this committee and its work should have more active, earnest, aggressive support from each mem-

ber of this association. It is a serious question from the broad standpoint of the material welfare of the nation. Its continued growth means the wiping out of rural communities and not only the retail dealer but the banker, editor, mechanic, and professional men are likewise affected. With these go the churches and schools that are the centers of social life. The best brain power and the staying qualities that are essential to its fullest success come from the rural districts, and anything that tends to decrease this supply is a national misfortune.

There is also a moral side to the question that is often overlooked. Some of our members took the position 20 years ago that I wish we might all follow: "We cannot furnish goods to catalogue houses, for we sell our goods to retail dealers on whom we depend to distribute them, and this implies on our part an obligation to protect them." "To sell the same goods to another party whose object and purpose would be to demoralize and destroy the trade of the other, would in our opinion be as unfair and unjust as to go direct to the dealer's customer, and we will not do either." History repeats itself. Our position in this matter is founded on fairness and justice, which in time will prevail. Twenty years ago the jobbers of a certain Western city were the strongest supporters of the catalogue houses. To-day they are as actively opposed to the system as your Catalogue House Committee.

The Association Work

is something that I cannot refrain from calling your attention to. Twelve years is a long time in the life of an active business man, and he has forgotten many things that happened during that time that he should have remembered, and he possibly has remembered a few things that he would gladly have forgotten. I had forgotten it myself, but in cleaning out my desk a few weeks ago to move to a new office, I dug up a paper I had read 14 years ago on trade conditions. After reading it I wanted more light, and I dug up some old sales books and records and the balance sheets of '91 and '92. I can't describe this. Words would fail, but I would give a good deal to impress on the mind of each member the mental impression that I received. It would make 200 loyal, active, aggressive members that would double the power and influence of the association and improve conditions to an extent that we do not dream is possible.

The results that have been secured in the last 12 years can be doubled in the next five if each member will take hold and lift. Many of us do not realize to what an extent conditions have improved, and if we do we fail to recognize fully the source of this improvement. Do we realize fully the advantage of the National Hardware Association? Do we realize that in the past some of the brightest minds in the Hardware trade have labored unceasingly and earnestly to secure the benefits that we now enjoy, not with any selfish purpose, but with the object and desire to build up the association and to benefit the trade at large? How can we honor them better than to emulate their generous and unselfish spirit and to follow the example they have set?

This Association Is Operated

not for the benefit of any one man or set of men, but for the greatest good to the whole. When any matter is in question involving the interests of the trade your able secretary is there to protect your interests, and certainly the experience he has gained in his 12 years of service and his loyalty and devotion to your interest is evidenced by the results secured. Some houses feel that they get more in proportion from what they pay the National Hardware Association than from any other one item in their expense account. Can we get more? I think we can. We owe it to ourselves and the association to give it our loyal and earnest support in thought, word and act. We owe it to our association, ourselves and our associates to place our business with those whose policy in the conduct of their business is fair and considerate of our interests and the interests of those through whom we distribute our goods.

When a Manufacturer Can Sell

an interest that is directly opposed to our own and then come to us and with an extra two or five take the business from a square, honest competitor who is fairly entitled to it, we hold that it is an unfair proposition to all three parties in interest, and a jobber or retailer who does this should have no complaint to make if the manufacturer sells the catalogue house and the consumer.

What we all need to cultivate is more backbone, more square-toed fairness, more disposition to help our competitor, which is indirectly a greater help to us than aggressive selfishness. We want less disposition to "trim" and tell what we intend to do with a mental reservation that we will find some way to evade doing it. When we all uphold and practice the association platform, "a high standard of business methods," we shall prosper as an association and as individuals to a greater extent than we have in the past, and our influence and usefulness will grow broader and stronger with the passing years.

SECRETARY-TREASURER FERNLEY'S ANNUAL REPORT.

Once more, and we hope not for the last time, it becomes our duty and pleasure to render an annual report. You will not expect me at this time of the year to review all the details of the year. This is unnecessary because you have had three letters each during the year in which various matters were reported which were subject to investigation and adjustment in our office.

While not seeking members, yet during the year we have had quite a number of voluntary applications, some of which have been favorably passed upon.

During the year we have visited about 60 per cent. of the members of the organization and have attended quite a number of association meetings. On all of these occasions we have been much gratified to learn that the work done by the National Hardware Association was fully appreciated by individual members, and that the local and sectional associations felt that our organization was helpful to them.

We have also visited several State Retail Hardware Association conventions and noted with much satisfaction the growth of this movement among our retail friends. Almost 10,000 retail merchants are connected with State associations and through these with the National Retail Hardware Association.

Financial Condition.

Our report as treasurer will show that during the year, notwithstanding the fact that we have had some unusual expenses, our income has been equal to the same, so that the very comfortable balance we had on hand at the close of last year is still intact.

Association Policy.

Some of the members of our association have thought that we were not quite aggressive enough in connection with matters which related to the proper protection of the jobbing trade. The policy pursued by the wholesale and retail drug associations has very frequently been alluded to, and the suggestion made that we should follow the lines which they were pursuing.

As you have already been advised, the United States Court has declared that the Drug Association has been too aggressive and that it has violated the Sherman Anti-trust law. I have very carefully followed the litigation alluded to and am quite convinced that the conciliatory policy, as outlined by our Executive Committee several years ago, is certainly a safer one to pursue than the aggressive one adopted by our friends in the drug business.

We thoroughly believe that if our manufacturing friends will not respect a courteously phrased expression of our preference in connection with the sale of goods to catalogue houses or any other class of purchasers they will not respect our demands, and therefore this association makes no demands. If a manufacturer of any commodity we handle believes it is just to furnish his goods either direct or indirect to any class of dealers who make a business of trade demoralization, as an association we simply say to that manufacturer that it is our preference that he should change his policy.

Be it said to the credit of the vast majority of manufacturers of Hardware and kindred lines that they have taken the position that the legitimate retail and jobbing trade of the country is entitled to at least this degree of consideration, and that they have acted accordingly.

There are a few manufacturers, most of whom do not make a high grade of goods, who are still permitting their prices to be demoralized. We believe that without any effort on the part of this association or any other organization these manufacturers will find that their goods will be supplanted by others in the estimation of the trade of the country.

Wholesale and Retail Joint Committee.

Our labors in connection with this branch of the work have been extremely pleasant and not so arduous as to break down our constitution. This Joint Committee has accomplished results which amply justify its existence. Your secretary-treasurer is also general secretary of this committee, and unhesitatingly states that a far better condition prevails than that which confronted the trade some two or three years ago. Our chairman has been active and earnest and has the confidence and esteem of all the members of the committee.

The Metal Department.

This branch of our association is in a very healthy condition. Yesterday a meeting was held under the auspices of the metal branch of the leading jobbers throughout the country of Tin Plate and Metals, the invitation being extended to members and nonmembers of this association. This is a branch of business which requires special technical knowledge and the employment of a very large amount of capital in proportion to the business transacted. It is a branch of the business where the

risk of depreciation in price is very large and therefore should pay a fair profit, and yet unfortunately conditions are such that the members of our association who deal in these commodities have indeed just reason to complain.

Hardware for Premium Purposes.

The tendency of some manufacturers to permit their high grade goods to be purchased by parties who desire to offer them as premiums for the sale of breakfast foods, tobacco, chewing gum and face powders is greatly to be deprecated. Our association at its last convention passed a resolution in which attention was called to the fact that premium goods practically cost those who receive them nothing, and indeed they are sold to the parties who give them away at a less price than the jobber is forced to pay, thus not only demoralizing trade prices but, if the practice is continued, the sale of such goods for legitimate purposes must necessarily be reduced in the future. The manufacturers are not alone to blame, as some members of this association have unfortunately supplied some of these gift houses.

One-Cent Letter Postage and Parcels Post.

These subjects can be well connected, as they both vitally affect the manufacturer, wholesaler and retailer of Hardware. Every one in the community is more or less of a correspondent, and every time a 2-cent stamp is placed on a letter 1¼ cents is paid to the Government as a profit, inasmuch as it costs but ¾ cent to collect, carry and deliver a letter weighing ½ oz. Second-class mail is carried at an enormous loss and fourth-class, which as you know is merchandise, costs about the amount paid—namely, 1 cent an ounce.

It is proposed by those who advocate a parcels post to change the rate to 2¼ cents per pound, or to be exact 11 lb. for 25 cents. A parcels post in this country can only be conducted at an enormous loss to the Government and will only be of advantage to the mail order houses.

Our association became a member of the National Board of Trade early in the year, and it was your secretary-treasurer's pleasure to represent you at the annual meeting of that body. The National Board of Trade has for years gone on record as favoring a parcels post. We presented the other side of the question and succeeded in having a clause inserted in its resolution on the question reading as follows: "We recommend a parcels post, provided that the same can be conducted without any expense to the Government."

Syndicate Buying.

At the convention of our association which was held in New Orleans in 1902, two of the prominent companies engaged in this line of business voluntarily offered to submit their list of clients to the secretary of this association and eliminate the names of such parties as should in the judgment of that official be denied a place on the list of a syndicate buyer pretending to represent jobbing interests.. The secretary-treasurer was directed to pursue this matter. Two other syndicate buyers afterward consented to do the same, and as a result a large number of parties who were not legitimate retailers or jobbers, but who did conduct business in a way which was demoralizing to the interests of both, were removed from the lists of the syndicate buyers alluded to. Subsequently applications for syndicate buying connections were submitted to the secretary of the association, and up to a few months ago the understanding was honestly adhered to.

Two of the four concerns who became parties to this agreement were tempted to evade it. One, however, of the two has made amends, and is now operating in conformity with the New Orleans agreement. We regret to say, however, that one of the four is still pursuing an independent course and has added names of some houses which had been dropped by the others. Through the influence of our members who are members of the syndicate alluded to we hope this syndicate buyer will also be induced to adhere to the agreement.

It has been said by some critics that this association has recognized syndicate buying and is supporting it. This is a mistake. Our association has never taken any action which would justify any one in stating that we either support or refuse to support syndicate buying.

Cash Discount.

Recently certain manufacturers have attempted to reduce the profits of both jobber and retailer by changing their terms from 60 days, with a discount of 2 per cent. off for cash in 10 days, to 60 days, and in some cases 30 days, with 1 per cent. for cash within 10 days. This action recalls the position taken by certain very large and influential manufacturers on or about July 1, 1899, when an announcement of the withdrawal of the cash discount by one of the most prominent combinations of manufacturers was followed by quite a number of smaller ones, and so numerous were these that it looked very much as if there was to be a complete revolution of the terms of selling Hardware and kindred lines.

This association through a very strong committee met the chief officers of the manufacturing corporation alluded to and used arguments which prevailed, so that in three months a discount of 1 per cent. was conceded, and in five months the discount of 2 per cent. for cash in 10 days was restored. At the convention of this association which was held in November, 1899, in Pittsburgh, the entire subject was carefully discussed and given mature consideration. Investigations proved that it would be a great hardship to deprive the retail trade of the cash discount, as it in turn allowed it to its customers who paid within a specified time. At the convention alluded to the following resolution was unanimously adopted:

Resolved, That it is the sense of the National Hardware Association that the discount, 2 per cent. for cash in 10 days, formerly given by the manufacturers of Steel and Iron goods be not construed as bank interest but as a premium for prompt payment and as an assurance or protection of credits, and, further, that such or similar discount be continued where still allowed and that we urge its restoration where it has been discontinued.

Our association took the position that the cash discount was not really interest on money, but a premium for anticipating the due date of a bill. After the convention alluded to nearly all the manufacturers conceded the justice of our claim, and it has only been within recent months that our manufacturing friends have agitated any change in the amount of the cash discount.

We do not ask those from whom we purchase to reduce their selling price; we simply ask them to figure the cash discount in the cost of the goods, just as they do what they expend for raw material, labor, possible losses, freight, administration expenses, good, nice salaries for themselves and other items too numerous to mention.

We find no fault with our manufacturing friends for pursuing this course; indeed, we rather commend it, but we do hold that it is unjust, unkind and ungenerous to attempt to force the trade of the country to buy goods without a discount or with 1 per cent. discount for cash in 10 days when both jobbers and retailers are compelled to give the cash discount on their sales of 2 per cent.

Statements have been made by some that the jobbers abuse the privilege; that they take 12, 15 and sometimes more days, and still deduct the cash discount. Such instances are comparatively small in number, and even should a member of this association ask for a premium when he is not entitled to it by reason of the terms of his contract it is the privilege, if not the duty, of the manufacturer to return the settlement and insist on the payment of the face of the bill when it matures. This association asks no consideration for those who violate their contracts. We therefore hope that our manufacturing friends, without any exception, will recognize that the universal terms for selling Hardware and kindred lines should be 2 per cent. for cash in 10 days.

Our Executive Committee, thinking that this matter was of great importance, on October 8 addressed a letter to over 200 leading manufacturers, 180 or more of whom are members of the American Hardware Manufacturers' Association. Up to date we have heard from 125 of these, and all but 15 are opposed to making any change, so that we consider that any general movement to change the amount of the cash discount will not meet with success.

THE annual meeting of the Wisconsin Retail Implement and Vehicle Dealers' Association will be held at Milwaukee, Wis., December 12, 13 and 14. This association was formed early in the year and was organized in response to the desire of many dealers, who had formerly attended the conventions of the Wisconsin Retail Hardware Association, to have an organization which might more thoroughly represent their particular trade. The convention of the Wisconsin Retail Hardware Association will be held, as usual, at Milwaukee the first week in February.

THE latest addition to the facilities of the Belknap Hardware & Mfg. Company, Louisville, Ky., has just been undertaken, contract having been let for a commodious warehouse. The building is to be erected on the corner of First and Washington streets and will occupy an area 179 x 195 ft. It will be nine stories and basement high and constructed entirely of reinforced concrete, using the Johnson system of reinforcing. The building will be used exclusively as a warehouse and will be provided with commodious locker rooms, shower baths and smoking rooms for the employees.

FACTORY COST AND BUSINESS METHODS.

STOCKROOM SYSTEM OF THE WIRE GOODS COMPANY.

THE WIRE GOODS COMPANY, Worcester, Mass., manufacturer of wire goods, of "Everything in Wire," to use its trade motto, has just occupied a new building devoted to the storage and shipping of finished goods. The arrangement of the building, coupled with the system of keeping track of stock in bins and in the works, presents an interesting example of what results are obtained by the use of modern factory methods.

Practically 30,000 sq. ft. of floor space are devoted to the storage, packing and shipping of goods, comprising 3200 different articles and sizes, every one of which must be carefully kept track of. This is readily accomplished by the use of a simple but comprehensive system, which is described below.

The Wire Goods Company carries its enormous line of wire goods with the purpose of furnishing everything in this line that may be needed in stocking a store or other establishment, and a great many of the orders are very widely diversified, as may readily be imagined. It is essential that a large stock of goods be kept on hand, for it is the aim of the company that there shall never be a missing line or size. Consequently the facilities for assembling an order must be such that there shall be the least possible delay in filling it. It is to this end that the management has studied out the problem of the new building, in its arrangement and facilities, and in the system that gives the maximum of efficiency.

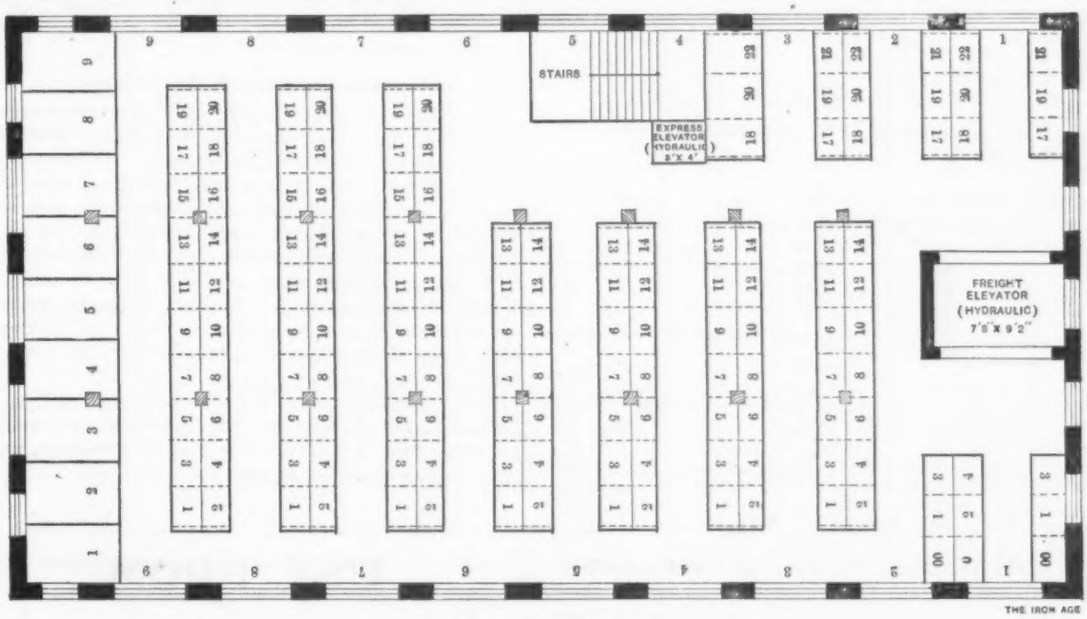


Fig. 1.—Plan of Stockroom.

Fig. 2.—One of the Alleys in Stockroom.

Stockrooms.

The building is six stories high, including a well lighted basement, and is 55 x 95 ft. on the ground. A portion of one floor is devoted to offices, a section of the first floor to the shipping room and a corresponding part of the second floor to the packing room. The arrangement of a stockroom floor is shown in Fig. 1. It will be noted that there are two elevators, one a rapid running express lift of small dimensions, the other a large freight elevator for moving heavy cases and other freight beyond the capacity of the smaller elevator. Every care was taken that there should be the greatest possible amount of daylight. The windows are broad and high, as little space as practicable being given to the brick walls. The experience of the company has demonstrated that ample light plays an important part in factory economy beyond mere illumination for employees at their work. Dark corners breed dirt and waste. They become catch-alls for everything, including goods which would have been salable had they not been allowed to rest in débris. The

company estimates that 99 per cent. of this class of loss is saved in the new building, where there is no place of obscure light. Greater neatness prevails in arranging goods in bins. Imperfect stock, if it has escaped the inspector's notice, quickly comes to light in the stockroom as the stock clerk fills the bins or assembles his orders. At the end of each alley is a broad, high window, the single exception being the alley chosen for the illustration, Fig. 2, that photographic conditions might be of the best. Electric lamps provide correspondingly ample light for days when daylight passes early.

The alleys are wide, to permit of the easy passage of

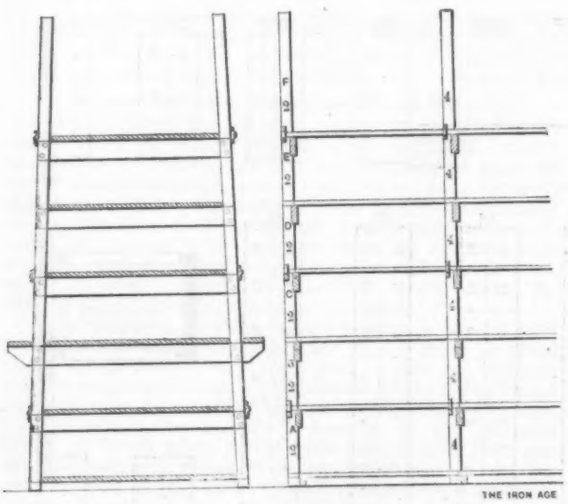


Fig. 3.—Detail of Bins.

trucks. The stacks of bins are heavily constructed of spruce timber and are built slightly tapering, narrowing as they ascend, as will be seen in Fig. 3, showing their construction. A wooden footway, 3½ ft. from the floor, extends the entire length of each side of every alley, as shown in Fig. 2. The step is used in connection with three railings of 1½-in. iron pipe, supported in wrought iron sockets. The footway and the railings permit the clerk easily to reach any desired bin.

Each Alley Has Its Number

and the stockroom floors are made to correspond exactly in this respect. That is to say, there is an alley No. 6 on every floor, and the alleys of that number are directly

		Floor Number	Alley Number	Row Letter	Bin Number
Soap Shakers	826	5	2	D	1
	836	2	4	A	163
Sponge Baskets	349	5	1	B	6
	350	5	1	B	8
	352	5	1	B	10
	354	5	1	B	12
Sink Strainers	0	4	9	—	Stall 3
	1	4	9	—	5

Fig. 4.—Page from Loose Leaf Stockroom Index.

over one another. Each longitudinal row of bins has its letter, A at the bottom and E at the top, and each vertical tier of bins has its number. All the numbers on the same side of all alleys are even and all on the other side are odd. The similarity of bin letter and number is strictly carried out in the arrangement. All alleys are identical. As one stands at the front of the building looking down any given alley the sections upon the right are numbered 1, 3, 5, &c., and the sections upon the left 2, 4, 6, &c. Thus on any floor or in any alley any given number will be found in exactly the same spot. The employee who has to get a given article wastes no time in looking for it. He has but to glance at a loose leaf stockroom index, sample page of which is shown in Fig. 4, and there he finds against the name of the desired article its floor, alley number, bin number and letter. He then knows exactly where to go. As a result of this arrangement of bins perfect familiarity with the stockroom is easily acquired.

The system of duplicating numbers on the several floors is carried to the stalls, where bulkier and more unwieldy goods are stored.

Truck for Assembling Orders.

In connection with the bin and stall arrangement attention may be called to the special design of truck used in assembling orders, which is shown standing in the alley in Fig. 2. The truck is heavily built of hard wood, bound throughout with wrought iron and has small wheels. A feature is the chain which keeps the handle always in an upright position ready to be seized by the employee, and which does not interfere with the action in turning sharp corners. Another convenient device is the wire basket hanging to a rail at the right of the picture, which is used in gathering together small packages that enter into an order.

Still another feature of the order filling system is a placard which informs an employee that he should fill his order from a surplus stock located elsewhere, rather than to take from the regular bin. The card, Fig. 5, has

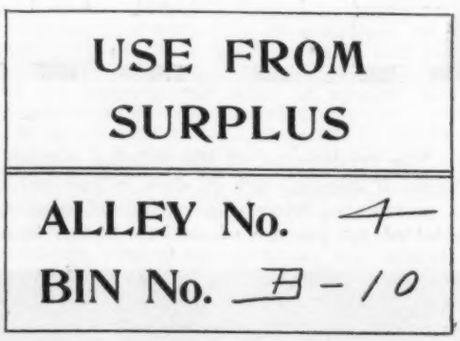


Fig. 5.—Surplus Stock Placard.

blank spaces in which are filled the location of the surplus stock. This card is frequently useful, especially when a new stock of certain goods has recently been delivered to the stockroom.

Stock Report.

The method of keeping track of the stock is not a complicated one, yet it serves its purpose very satisfactorily. Always on hand in the stockrooms are blank stock reports, as shown, filled out, in Fig. 6. These are used by stock clerks in a constant watching of the bins, which constitutes a sort of perpetual running account of stock. The clerk fills out the name of the article, its number and the quantity on shelf and passes the report to the stockroom office, where the stock books give the remaining information needed, the quantity stored, orders in process and quantity last ordered.

The office stock clerk fills in the quantity to be ordered of each article the stock of which is low, and for it fills out a stock order, Fig. 7, which goes to the office for approval. It will be seen that the order contains the necessary information for the department foreman in laying out his work. When the order is received in the factory the date is entered and later on the date of the completion of the order, when the stock order is returned to the stockroom office to be entered in the record of the stock on hand. The office stock clerk in examining the stock reports received from the stockrooms also as-

STOCK REPORT.

SEP 15 1906 190

Article	Number	Quantity on Shelf	Quantity Stored	Orders in Process	Quantity last Ordered	Quantity to be ordered
Drawers	0277	56 Gro	None	120 Gro	—	O.K.
	278	25 "	"	180 "	—	O.K.
	280	40 "	"	None	120 Gro	120 Gro
	282	28 "	50 Gro	"	60 "	O.K.
	252	14 "	None	"	12 "	O.K.
Forks	307	176 "	118 Gro	"	240 "	O.K.
	308	132 "	53 "	"	160 "	O.K.
	309	117 "	None	"	24 "	O.K.
	311	112 "	"	"	24 "	24 Gro
	317	115 "	"	240 Gro	300 "	O.K.
Broilers	141-9x8	101 "	"	None	84 "	O.K.
	9x10	52 "	"	"	72 "	72 Gro
C+H Hook	0123	1176 "	"	1600 Gro	—	O.K.
	23	1192 "	"	1000 "	—	O.K.
	123	1597 "	"	1000 "	—	O.K.
Skimmers	0292	256 "	129 Gro	None	600 Gro	600 Gro
	292	179 "	None	300 Gro	300 "	O.K.
	995	311 "	117 Gro	None	360 "	O.K.

Reported by J. Sargent

Approved by W. F. Smith

Checked by W. F. Smith

Fig. 6.—Keeping Track of Stock.

certains his "hurries"—that is, those goods which are so low as to require precedence in manufacturing.

His next work is to enter the results of the stock reports in department books, assembling the orders of goods required from each department. In the books the goods are designated "out of stock," "very low," or "low." Each week the books go to the superintendent's office, giving him a complete record of goods which must be replenished by each department of the factory. From each book a stenographer makes out a statement to that department, which is known as a factory hurry slip, one of which is shown in Fig. 8. Goods out of stock must be attended to immediately, goods very low next, and so on. Of course the goods thus reported low do not constitute the entire factory output, for there are lines of goods in steady demand which must always be in process in the works.

Economy in Handling Stock.

The Wire Goods Company believes that greater economy of handling goods in stock is obtained from a building containing a number of floors than if the stockroom were spread over a one-story building of correspondingly great area. But this condition results not alone from the type of the building, but in the judicious distribution of the various classes of goods in the building. The effort has been made to store goods for which the greatest demand exists near the packing and shipping rooms, and those goods for which there is the least call in the farthest corners of the upper floor of the building. In other words, the demand for a certain article carried in the stockroom may be told by its location.

Shipping and Packing Rooms.

A study of the interior of the shipping room, Fig. 9, will show the well from the floor above, through which large amounts of goods are passed. On the shipping room floor and on that above it are stored those articles for which there is constant demand in making up orders. The result of this general arrangement of goods, which was given much study that has proved to have been well worth the while, is to reduce to the smallest possible extent the amount of labor necessary in assembling orders and taking them to the shipping room and also the labor of distributing goods to the bins. The shipping room has two entrances, one for the unloading of goods and supplies, the other for the loading of goods which are to be shipped away.

THE WIRE GOODS COMPANY.

HARDWARE MANUFACTURERS.

"EVERYTHING IN WIRE."

WORCESTER, MASS. U.S.A. September 17, 1906

Bending Department

GOODS OUT OF STOCK

160-1	Hooks
1 1/4	"
1 1/2	"
058	Hooks
52 1/2	Hooks
40-6"	Gate Hooks
181-2	Cup "
8	Garden Eyes
40-5	Hook
1048-8	Hook
35-7	Cor Hook
3	Nuts

GOODS VERY LOW

610	Brackets
194 1/2-3/16	Chains

GOODS LOW

63	Hooks
515	Hooks
593	Hooks
25	Hitch Rings
419	Irons
191	Hooks

Fig. 8.—Factory Hurry Slip.

STOCK ORDER. SEP 17 1906

QUANTITY	ARTICLES	NUMBER	Size Wire	Length Cut	Weight per Gross	Wire Required	Weight of Wire used	Date Completed: Bending Room	Date Completed: Threading Room
500 Gro	Clothes Line								
	Hooks	420	4	6"	7-0	3500	3528	9-19-06	9-24-06

NOTE CORRECTIONS:

REMARKS:

Ordered by J. F. C. Approved by H. A. B.

Fig. 7.—Order for Needed Stock.

The packing room also is most conveniently arranged, large and light and with plenty of ventilation. A general idea of its arrangement may be obtained from Fig. 10.

Labels and Boxes.

In connection with stockroom arrangements the company's system of labels and boxes is worthy of mention. The Wire Goods Company has adopted a black box with

yellow label as its standard, and the same colors are employed in the wrappings of goods which are not boxed. Exceptions are made, of course, where custom has decreed that certain colors mean certain things in the Hardware store, such as Wood Screws, Double Headed Tacks, &c. But in every other instance the company sticks to its black and yellow color scheme, and always to its

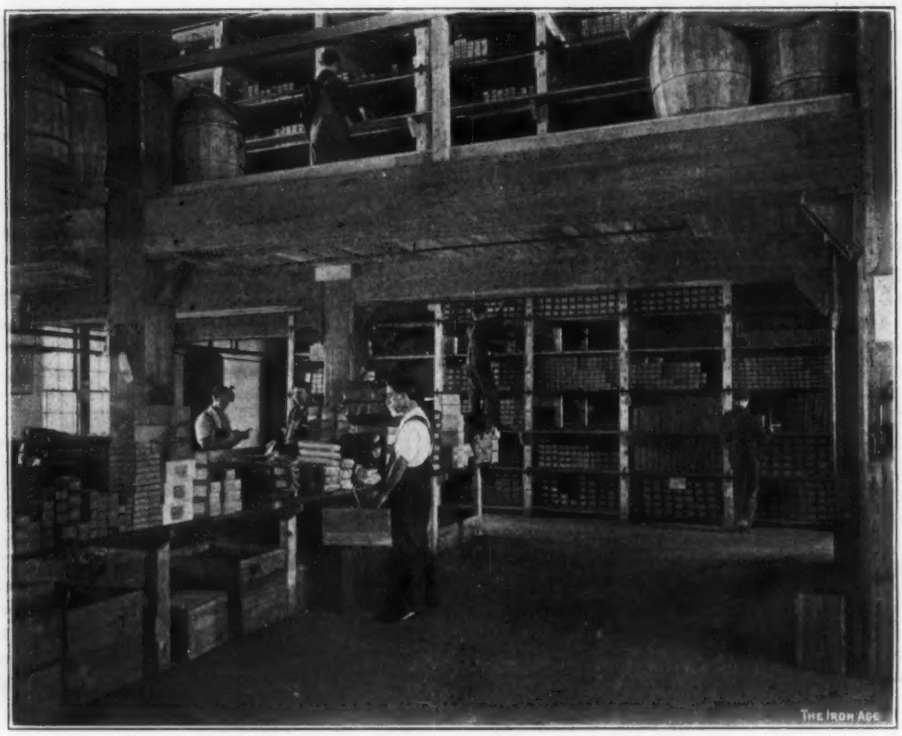


Fig. 9.—A View of the Shipping Room.

trademark, the "Q Crown," as it is called, a letter Q under a coronet and the words, "A Mark of Quality." The labels are carefully arranged in racks made for the purpose in the packing room, where they are always in hand for use.

The Number System

in designating the various articles and sizes and varieties of the great line is also interesting. The first number indicates finish, when there is a variety of finish in a certain line, and the last number the size. Take, for instance, the line of Coat and Hat Hooks. The figure 0 stands for copper finish, 2 for japanned, 1 for bronzed, 4 for tinned, 5 for brass plated, 6 for nickel plated and 7 for solid brass. The numeral 2½ at the end of a number means it is a 2½-in. Hook. Thus, the 0122½ Hook indicates that it is a 2½-in. Hook, copper finished. The numerals 12 in the middle of the number are arbitrary ones indicating a line. Taking another instance, that of Letter Baskets, where there is no difference of finish, the first number indicates the number of tiers, so that 214 means a two-tier Basket, and 514 a five-tier Basket.

Fig. 10.—A Well Lighted and Ventilated Packing Room.

THE GALTON MFG. COMPANY, Cleveland, Ohio, has been organized for the manufacture of Brushes, Brooms and Specialties for the Hardware trade. It has leased the plant formerly occupied by the C. S. Van Wagoner Company. E. F. Streich, for 11 years past with the Osborn Mfg. Co., Cleveland, is president, and John H. Galloway, for several years with the Osborn Company, is secretary and treasurer.

UNITED STATES PRODUCTION OF CUTLERY AND EDGE TOOLS.

FROM OUR SPECIAL CORRESPONDENT.

WASHINGTON, D. C., October 16, 1906.

THE statistics covering the production of Cutlery and Edge Tools in 1905 have been compiled by the Census Bureau, and are presented below in comparison with the returns for 1900. The report is in some respects more satisfactory than that covering Hardware, which was published in these columns last week, inasmuch as the classification is more definite and the returns therefore more accurately represent conditions in the industry. In these figures are included every establishment in the United States in which more than 50 per cent. of the product in 1905 consisted of Cutlery and Edge Tools. A few establishments which turned out these products in comparatively small quantities are not included, but inasmuch as a few manufacturers of Cutlery and Edge Tools produced relatively small quantities of other goods the Census Bureau assumes that these various discrepancies practically offset each other. Following the invariable rule of the bureau not to disclose individual operations, the establishments in all the States in which less than three manufacturers were located in 1905 are aggregated under the head of "all other States."

The figures for 1905 show 254 establishments, as compared with 309 in 1900. This decline is attributed to the general tendency toward consolidation in manufacturing industries. The capital employed in 1905 was $20,809,821, as compared with $16,532,383, or a gain of 25 per cent. In 1905 there were 14,545 wage earners in the industry, receiving $7,076,018 in wages, as compared with 12,069, receiving $5,673,619, in 1900. Thus while there was an increase of 20 per cent. in the number of wage earners, wages rose 24 per cent. The miscellaneous expenses of the industry in 1905 aggregated $1,881,776, as compared with $945,805 in 1900. This increase of practically 100 per cent. is attributed chiefly to increased rentals, selling costs and advertising appropriations.

The total cost of materials in 1905 was $5,275,550, as compared with $5,116,042 in 1900. The aggregate value of the products of the industry in 1905 was $18,614,929, as compared with $14,881,478 in 1900, a gain of 25 per cent. The very small increase in the cost of materials, amounting to only 3 per cent., is significant in view of the 25 per cent. increase in the value of the product, which agrees closely with the increase in capital and wages during the period covered by the statistics, especially when the fact is borne in mind that nearly all classes of material have risen in cost during the past five years.

The notable gain in the value of the products of the industry in 1905 over 1900 is emphasized by a comparison with the figures covering previous censuses. The output of the industry in 1880 was valued at $11,661,370 and in 1890 declined to $11,110,614. It rose again in 1900 to $14,881,478, showing an increase of $3,770,864. As the product of 1905 was valued at $18,614,929, it appears that the gain in five years was greater than that recorded in any previous ten years. The following tables show the details of the returns for the United States and for all the States in which more than three establishments were reported:

United States.	1905.	1900.
Establishments	254	309
Capital	$20,809,821	$16,532,383
Wage earners	14,545	12,069
Wages	$7,076,018	$5,673,619
Miscellaneous expenses	$1,881,776	$945,805
Materials	$5,275,550	$5,116,042
Products	$18,614,929	$14,881,478

Connecticut.		
Establishments	40	44
Capital	$6,086,834	$5,855,752
Wage earners	4,565	4,077
Wages	$2,459,855	$2,087,198
Miscellaneous expenses	$667,520	$335,952
Materials	$1,842,303	$1,904,968
Products	$6,167,852	$5,362,620

Illinois.		
Establishments	6	3
Capital	$666,535	$371,583
Wage earners	441	350
Wages	$163,021	$114,110
Miscellaneous expenses	$73,000	$61,154
Materials	$159,994	$127,090
Products	$486,446	$357,477

Indiana.		
Establishments	6	8
Capital	$356,770	$583,186
Wage earners	293	745
Wages	$132,896	$226,686
Miscellaneous expenses	$33,119	$54 617
Materials	$76.515	$243.052
Products	$313,392	$812,883

Maine.		
Establishments	9	11
Capital	$89,511	$123,667
Wage earners	48	63
Wages	$20,964	$21,149
Miscellaneous expenses	$7,128	$4,976
Materials	$16.567	$29,882
Products	$72,680	$78,476

Maryland.		
Establishments	3	3
Capital	$7,990	$16,200
Wage earners	11	15
Wages	$5,445	$7,164
Miscellaneous expenses	$776	$842
Materials	$1,364	$4,138
Products	$11,375	$16,022

Massachusetts.		
Establishments	39	65
Capital	$2,900.355	$3,116.274
Wage earners	2 169	2,100
Wages	$1,090.738	$1,083 281
Miscellaneous expenses	$211,774	$130,209
Materials	$692,036	$806,601
Products	$2,584,927	$2,608,075

Michigan.		
Establishments	9	8
Capital	$182,426	$94,400
Wage earners	133	103
Wages	$67,424	$38,710
Miscellaneous expenses	$23,769	$7.930
Materials	$46,669	$36.471
Products	$177,269	$120,630

Missouri.		
Establishments	Not separately reported.	6
Capital		$43,597
Wage earners		43
Wages		$13,757
Miscellaneous expenses		$5,937
Materials		$18.202
Products		$53,456

New Hampshire.		
Establishments	7	6
Capital	$327,426	$319,713
Wage earners	318	357
Wages	$148,800	$164,102
Miscellaneous expenses	$20,038	$16,907
Materials	$136,891	$113,118
Products	$382,723	$365,581

New Jersey.		
Establishments	19	19
Capital	$1,127,391	$629,022
Wage earners	1,001	775
Wages	$447.980	$328,670
Miscellaneous expenses	$96.735	$40,437
Materials	$439,001	$247.547
Products	$1,205,623	$821,735

New York.		
Establishments	48	59
Capital	$2,747,154	$1,987.913
Wage earners	2,497	1,575
Wages	$1,254.376	$710,515
Miscellaneous expenses	$337,563	$114.070
Materials	$676,251	$554.864
Products	$2,949,079	$1,665,644

Ohio.		
Establishments	17	24
Capital	$1,734.637	$1,114,745
Wage earners	914	763
Wages	$391,646	$375.433
Miscellaneous expenses	$205,397	$60,408
Materials	$333,550	$460,825
Products	$1,272,515	$1,104,438

Pennsylvania.		
Establishments	29	31
Capital	$3,774.070	$2,027,680
Wage earners	1,566	1,005
Wages	$663.867	$445.543
Miscellaneous expenses	$158,592	$76.569
Materials	$532,644	$461,576
Products	$2,117,603	$1,212,665

Washington.		
Establishments	3	Not separately reported.
Capital	$4,250	
Wage earners	7	
Wages	$6,584	
Miscellaneous expenses	$1,600	
Materials	$1,865	
Products	$13,500	

Wisconsin.		
Establishments	3	5
Capital	$12,650	$50,722
Wage earners	15	19
Wages	$9,000	$9,660
Miscellaneous expenses	$1,047	$842
Materials	$4,512	$24,625
Products	$21,500	$46,528

All Other States.		
Establishments	16	17
Capital	$791.356	$197,929
Wage earners	567	79
Wages	$213.422	$47,641
Miscellaneous expenses	$43.718	$28,865
Materials	$315,388	$83,083
Products	$838,445	$255,848

As in the case of Hardware, the supremacy of the

State of Connecticut in the industry engaged in the manufacture of Cutlery and Edge Tools is emphatically shown by these figures. In 1905 the State is credited with almost exactly one-third the output of the entire United States. It is suggestive, however, that in 1900 Connecticut's share of the total output was 36 per cent. and that while the United States as a whole scored a gain of 25 per cent. in the value of its product in 1905 over 1900, Connecticut gained only 15 per cent.

New York, which ranked third in importance in 1900, displaced Massachusetts in the second rank in 1905, its product rising in value from $1,665 644 to $2.949,079, a gain of 77 per cent. The number of establishments in New York decreased from 59 to 48, which is in accordance with the general tendency of the industry to consolidate small establishments.

The output of Massachusetts, which occupied third place in 1905, was valued at $2,584,927 as compared with $2,608,075 in 1900. It will be noted that Massachusetts lost nearly 50 per cent. of her establishments and that the total capital engaged in the industry also declined, although there was a very small increase in the number of wage earners, wages paid and miscellaneous expenses. The cost of materials showed a decline in considerably greater ratio than the reduction in output.

Pennsylvania ranked fourth in value of output in 1905, showing a gain of no less than 74 per cent., or but slightly below the increase recorded by New York. Every item in the returns for 1905 shows a substantial increase except the number of establishments, which declined, although by no means in proportion to the general reduction throughout the country. As in the case of New York, the increase in the cost of materials did not keep pace with the rise in the value of the product.

W. L. C.

DEATH OF JOSEPH F. GLIDDEN.

JOSEPH F. GLIDDEN, the inventor of Barb Wire, died at his home in DeKalb, Ill., Tuesday, October 9. Mr. Glidden was born in Charleston, N. H., January 18, 1813. Soon afterward his parents moved to western New York, and he was reared on a farm. Mr. Glidden removed to a farm in Ogle County, Ill., in 1842, and three years later located in DeKalb. It was while at the farm that he conceived the idea of the Barb Wire and put the invention into practical use on his own farm, where its efficiency as a stock-proof fence was soon demonstrated. The process of manufacture was crude in the extreme, the barbs being cut by hand, and first a pair of pliers and afterward the parts of an old coffee mill were extemporized as a machine for coiling them about the wire. When a piece 20 or 30 ft. long had been barbed a smooth wire was placed beside it and one pair of ends fastened to a tree, and the others attached to the axle of a grindstone, which by turning with a crank gave it the twist.

About this time I. L. Ellwood, who was engaged in the retail Hardware and Stove business in DeKalb, became associated with Mr. Glidden and they formed a copartnership under the firm name of Glidden & Ellwood, and began the manufacture and introduction of the fence. The "factory" was moved from the farm to the village and a step in advance taken by using horsepower for doing the twisting, the barbs being placed on one end of the wire and then placed the proper distance apart by hand. By this method 100 lb. per day was a good average to the workman. The first year the sales of the Barb Wire were meager and confined to the vicinity of DeKalb, where the proprietors would go out themselves and put up the fence, guaranteeing satisfaction or no pay. It was a novelty and was at first looked upon with distrust but gradually gained favor, and in 1875 the firm built the first part of the old brick shop, put in a small steam engine, which was made to do the twisting, and Mr. Glidden and P. W. Vaughan obtained a patent for some devices for barbing and spooling. About this time H. B. Sanborn and J. P. Warner were made general agents for the introduction and sale of the fence. During this season the firm, being in need of more capital and longer credit, as the returns from its sales were slow coming in, offered a full one-half interest in the patents and business to prominent capitalists for $10,000 and were refused. The following winter a 150-ft. addition was made to the shops, a 40-hp. engine was added, and with the opening of the spring trade the firm was making and selling a carload of fence per day.

In 1876 the Washburn & Moen Mfg. Company, Worcester, Mass., noticing an increasing demand for a size of wire not heretofore called for to any great extent, began to investigate the cause of it and subsequently purchased Mr. Glidden's half interest in the patents and business and formed a copartnership with Mr. Ellwood. Mr. Glidden's business connection with the industry practically ceased when he disposed of his interest, although he was for many years a stockholder in the Superior Barbed Wire Company and derived handsome royalties as the inventor of several patents.

Mr. Glidden was twice married. In 1837 in Clarendon, N. Y., he married Clarissa Foster, who died in 1843, and in 1851 he wedded Lucinda Warne. He was regarded by his neighbors with great affection for his numerous acts of benevolence and by the gift of 60 acres as a site for the Northern Illinois State Normal School and was instrumental in securing the location of that institution within the limits of DeKalb.

PRICE-LISTS, CIRCULARS, &c.

Manufacturers in Hardware and related lines are requested to send us copies of catalogues, price-lists, &c., for our catalogue department in New York; and at the same time to call attention to any new goods or additions to their lines, of which appropriate mention will be made besides the brief reference to the catalogue or price-list in this column.

G. H. GRIMM, Rutland, Vt.: Illustrated catalogue devoted to Champion Evaporators, Sap Spouts and Buckets, Syrup Cans, &c.

NEWHALL CHAIN FORGE & IRON COMPANY, 9-15 Murray street, New York: Catalogue No. 101, descriptive of Hand Forged Crane, Block and Hoisting Chain and the method of manufacture.

ROYAL MFG. COMPANY, Lancaster, Pa.: Illustrated pamphlet relating to Alundum Grinders and Tool Sharpeners. These include Hand and Foot Power Grinding Machines, Sickle and Disk Grinders.

THE STARR BROS. BELL COMPANY, East Hampton, Conn.: Catalogue No. 59, illustrating Altar and Lodge Bells, Call, Cow, Dog, Door, Tea, Hand, Milkmen's, Sheep, Team and Turkey Bells, Gongs, Sleigh Bells, Pole, Saddle and Shaft Chimes and Swedish Bells.

POWERS PUBLISHING COMPANY, Norwalk, Ohio: Catalogue No. 4 of Hardware Electrotypes; also supplement sheet to catalogue. These Electrotypes are designed for use in advertising.

THE S. M. HOWES COMPANY, 40-46 Union street, Boston, Mass.: Illustrated catalogue of folding screens for the fireplace. The line comprises a large variety of styles, sizes and finishes.

MISCELLANEOUS NOTES.

Alpha Pure Seamless Inner Tire Tubes.

Parker, Stearns & Co., 229 South street, New York, making standard rubber goods and specialties, have just put on the market a complete line of Alpha seamless inner tubes for automobile tires. The feature of this product is the quality of the rubber and workmanship. The material is the best Para rubber and the tubes are fitted with Schrader universal valves. The manufacture of this line of inner tubes resulted from the dissatisfaction caused by such tubes already on the market and used by the senior partner of the company on his own motor cars. He first made some for himself and then for general trade. They are made in 23 sizes, from 26 x 2½ in. to 35 x 5 in., listing from $4.50 to $18 each, and all

are guaranteed of the highest grade and against imperfections in manufacture.

The Osgood Railroad Track Scale.

The Osgood Scale Company, Binghamton, N. Y., is manufacturing a U. S. Standard railroad track scale, built either for steel or wood frame. The depth of pit required is only 4½ ft. and the scale is suspended by zee bars embedded in a wall of solid masonry. It is explained that the full benefit of the wall is thus obtained, not only as a wall, but as a support for the scale throughout its entire length. The scale can be built in damp, low ground or even in shallow water without interfering with the working parts of the scale. The maker claims that the scale presents a saving in construction, timber and depth of pit; that there are comparatively few working parts and that the levers, loops and pivots are exceptionally strong. All adjustments and inspections can be made from the top of the scale.

Alundum Grinding Machines.

Royal Mfg. Company, Lancaster, Pa., is offering grinding machines as shown herewith. The manufacturer states that alundum is the hardest, sharpest and most durable abrasive material known, the principal raw material used in its production being bauxite, an amorphous hydrate of aluminum. The construction of the machines shown is similar, but the frame and the gear wheels of the foot power grinder are heavier than those of the hand power machine. The grinding wheel of either machine is

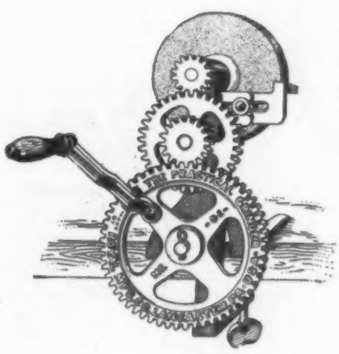


Fig. 1.—Alundum Grinding Machine No. 01.

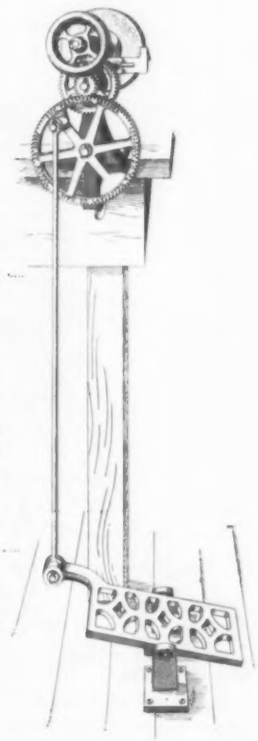


Fig. 2.—Foot Power Alundum Grinding Machine No. 10.

easily removed, being held in place by a washer nut. The spindles are of cold rolled steel and the best grades of cast iron are used for gear wheels and frames. The parts are interchangeable and the grinding wheels require no water and, it is explained, are nonheating and will not draw temper. In the foot power machine the treadle is strong and the foot rest is made to suit the foot of the operator. The movement is easy and works on a V and is regular and continuous. The company makes a household machine, smaller than that shown in Fig. 1, and a somewhat larger one for farm and machine work, also sickle and disk grinding machines of alundum.

Peerless Detachable Sash Support and Weather Strip.

The accompanying cuts represent an attachment for a window by which, without the use of tools, the sash may be removed for washing, while also forming a weather strip for keeping out cold winds and dust. The device may be used on any window having the ordinary weights or sash balances and requires only a slight change in construction. In Fig. 1 a window is shown with the lower sash removed and turned about, showing the weather

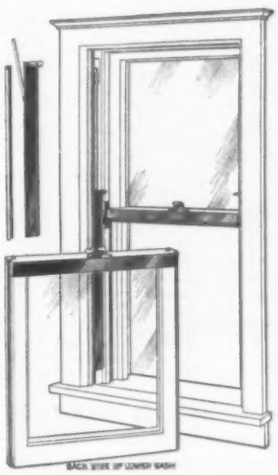


Fig. 1.—Peerless Detachable Sash Support and Weather Strip.

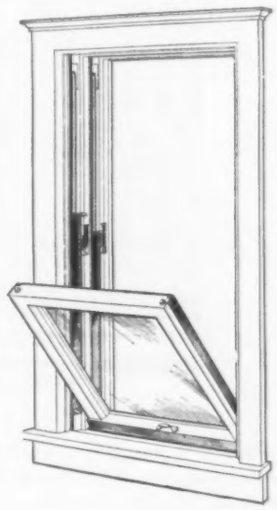
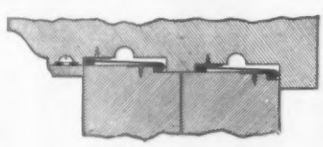


Fig. 2.—Lower Sash Removed Entirely and Upper Sash Drawn Down and Partially Removed.

strip at the sides and meeting rail, and the spring buttons in the top. The weights, or balances, are not attached to the sash, but to the metal supporting strip which fits over the edge of the sash. A short pin projects from the bottom end of this strip upon which the sash rests, a small pocket being bored in the lower edge to receive it, and the upper end of the strip is bent over the top of the sash, allowing the spring button to project upward through the hole in the end of the strip. When the sash is released by pressing upon the spring buttons the metal strip is automatically locked down by the spring shown in the parting strip just below the top sash, thus holding the weights in position until the sash is replaced. At the left side of the illustration is shown the sash supporting strip with sash cord attached, and also a section of the holding strip in which the sash sup-



Lower Sash. Upper Sash.

Fig. 3.—Cross Section Showing Form of Bent Metal Parts.

porting strip slides. Fig. 2 shows the lower sash removed entirely and the upper sash drawn down and partially removed. The sash may be sustained in this position while being washed, if desired, instead of being taken entirely out. The cross section, Fig. 3, shows the form in which the metal parts are bent to form a thoroughly windproof window. At the left hand side a window stop is shown, which may or may not be used, as desired. The stop is so made that it can be instantly removed with the hands without loosening any screws or nails. The device is referred to as particularly valuable for use in high buildings, as it entirely obviates the necessity of standing on the outside of the window when washing the glass. The Hardware Supply Company, Grand Rapids, Mich., is putting the device on the market.

The Richards Non-Sag Door Stay.

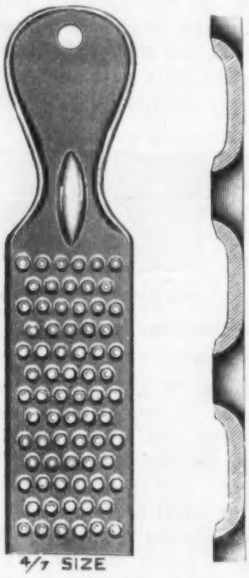
The Richards Mfg. Company, Aurora, Ill., is putting on the market the Non-Sag door stay shown in the accompanying cut, which represents a door which has sagged and has been brought into its original shape by the use of

The Richards Non-Sag Door Stay.

the stay. The adjustable feature, by means of a threaded rod and nipple, is simple and positive, and different degrees of tension may be had by using the small flat wrench, shown at the bottom of the illustration, which is furnished with each set. The claims are made that the stay can be applied to any door and will take up the sag, restore the door to its normal shape and keep it there; also that it will keep new doors from sagging or loosening at the joints. The device can be put on any part of a door, upper or lower, or on either side, and has a tensile strength of over 400 lbs. The stay is especially desirable for use on screen doors.

Dunlap's Nutmeg Razor.

The accompanying cuts represent front and sectional views of a nutmeg razor offered by J. S. Dunlap, 39-45 West Randolph street, Chicago, Ill. The razor is made of steel and protected by a heavy plating of nickel. The



Dunlap's Nutmeg Razor.

device is described as shaving the nut, instead of tearing it into coarse lumps, and liberating the aromatic oil perfectly. The point is made that the operator's fingers are not as likely to become lacerated as with the ordinary grater.

Combination Wrench and Plier.

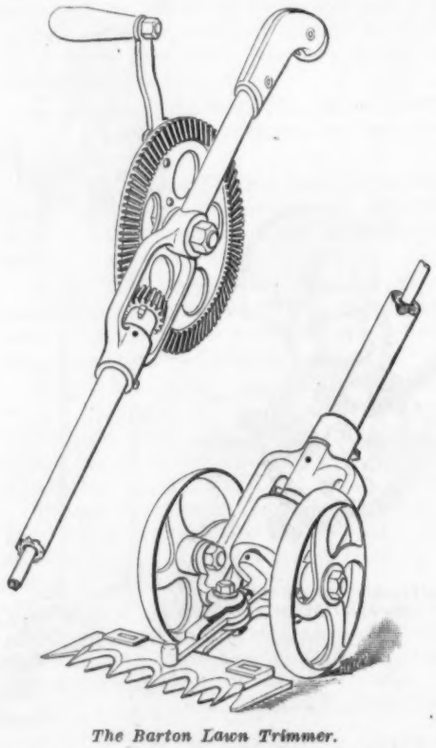
The Irving Mfg. & Tool Company, 157 Chambers street, New York, has recently put on the market the combination pipe and nut wrench and gas plier here illustrated. The principal novelty of this tool is the formation of the jaw, which permits of its being used as a pipe wrench for the smaller sizes of pipe. As in similar tools it has a screw driver and wire cutter, and in consequence of the slip joint can be used variously on gas burners, pipe, rods and similar classes of material. It is especially

Combination Pipe and Nut Wrench and Gas Plier.

serviceable for all round work, particularly as a household tool. It is made in 6-in. size, black finish, with polished jaws and also nickel plated.

The Barton Lawn Trimmer.

The Supplee Hardware Company, Philadelphia, Pa., is putting on the market the lawn trimmer shown herewith. The frame of the trimmer is of malleable iron and the blades are of tool steel. The handle has a pistol grip which facilitates the adjustment of the machine when in use to any position required; the operating crank and



The Barton Lawn Trimmer.

wheel may be placed on either side of the shaft so that either right or left handed people can use it, and the wheels have beveled faces so that the machine can be easily crated when desired. The machine is 4 ft. long, cuts 6½ in. and weighs about 12 lb. The stubble may be left any desired hight by raising or lowering the handle, the hight and thickness of the grass being of no consequence. The machine is designed to take the place of the grass hook and hand shears in trimming a lawn after the lawn mower has been used; getting into corners or under wire or iron fences, around trees, stumps, shrubbery, hedges, ditches or any place where there is room for the 7-in. cutter bar to enter. The parts are few and the adjustments of the spring tension simple. The blades will hold their edge with proper care and, if necessary, are easily resharpened with a file.

Giant Button Plier No. 1000.

Utica Drop Forge & Tool Company, Utica, N. Y., with New York office at 108-110 Duane street, is putting on the market a new design of button plier as shown herewith. In the new design the company has kept in view the fact that much of the wire now in use is made of tougher and harder material than formerly. The plier illustrated is referred to as being of the best quality and finish, while the handles are made so that the greatest pressure can be applied to the best advantage, which together with their increased length makes cutting easier. All sizes of the plier are designed in proportion with the 10-in. size. The plier has four wire cutters, the two between the jaws being intended to hold the wire after it is cut, an advantage in handling wire. The burner or pipe grip further increases the utility of the tool.

Giant Button Plier No. 1000.

J. L. Fulton, proprietor of the East End Hardware Company, East Liverpool, Ohio, has sold his business to a stock company composed of G. B. Batey, Edward Adams and Emmett B. Crites, all of that city. Mr. Adams will have active charge of the business. He has been connected for a number of years with the King-Eells Hardware Company, while his partners have been engaged in the general roofing and furnace business.

PAINTS, OILS AND COLORS

Animal, Fish and Vegetable Oils— ℔ gal.

Linseed, City, raw	.38 @39
City, Boiled	.40 @41
State and Western, raw	.37 @38
Raw Calcutta, in bbls	@..
Lard, Extra Prime, Winter	.70 @71
Extra No. 1	.47 @49
No. 1	.40 @44
Cotton-seed, Crude, f.o.b. mills	.22½@25
Summer Yellow, Prime	.37½@38
Summer Yellow, off grades	@..
Sperm, Crude	.53 @..
Natural Spring	@..
Bleached Spring	@..
Natural Winter	.63 @65
Bleached Winter	.66 @67
Bleached Winter, Extra	.68 @69
Tallow, Prime	.51 @53
Whale, Crude	.32 @33
Natural Winter	.43 @44
Bleached Winter	.45 @46
Extra Bleached Winter	.47 @48
Menhaden, Brown, Strained	.28 @29
Light, Strained	.27 @30
Bleached, Winter	@..
Extra Bleached, Winter	@..
Southern	.21 @..
Cocoanut, Ceylon	℔ lb 8¼@..
Cochin	℔ lb 9 @ 9⅛
Cod, Domestic, Prime	.30 @33
Newfoundland	.35 @37
Red, Elaine	.37 @42
Red, Saponified	℔ lb 4⅜@ 5
Olive, Italian, bbls	.55 @57
Neatsfoot, Prime	.48 @49
Palm, Logos	℔ lb 6¼@ 6 4-10

Mineral Oils—

Black, 29 gravity, 2@30 cold test	℔ gal. 10½@11¼
29 gravity, 15 cold test	11½@12½
Summer	10½@11½
Cylinder, light filtered	.18 @19
Dark filtered	.16 @17
Paraffine, 903-907 gravity	13½@14
903 gravity	12½@13
883 gravity	10¼@10¾
Red	12½@14

Miscellaneous—

Barytes:	
White, Foreign	℔ ton $18.50@20.00
Amer. floated	℔ ton 19.00@.....
Off color	℔ ton 11.50@15.50
Chalk, in bulk	℔ ton 3.00@ 3.25
In bbls	℔ 100 lb ....@ .35
China Clay, English	℔ ton 11.00@17.00
Cobalt, Oxide	℔ 100 lb 2.50@ 2.60
Whiting, Commercial	℔ 100 lb .43@ .48
Gilders	℔ 100 lb .50@ .55
Ex. Gilders	℔ 100 lb .55@ .60

Putty, Commercial— ℔ 100 lb

In bladders	$1.70 @1.85
In bbls. or tubs	1.20 @1.40
In 1 lb to 5 lb cans	2.65 @2.95
In 12½ to 50 lb cans	1.50 @1.90

Spirits Turpentine— ℔ gal.

In Oil bbls	69½@70
In machine bbls	70 @70½

Glue— ℔ lb

Cabinet	.11 @15
Common Bone	.. 7 @ 9
Extra White	.18 @24
Foot Stock, White	.11 @14
Foot Stock, Brown	8 @11
German Hide	.12 @18
French	.10 @40
Irish	.13 @16
Low Grade	9 @12
Medium White	.14 @17

Gum Shellac— ℔ lb

Bleached Commercial	.47 @47½
Bones, Dried	.57 @59
Button	.40 @50
Diamond I	.53 @55
Fine Orange	.50 @52
A. C. Garnet	.47 @47½
Kala Button	.37 @38
G. A. L. Garnet	.45 @45½
D. C	.55 @58
Octagon B	@53½
T. N	48½@50
V. S. O	.54 @55

Colors in Oil— ℔ lb

Black, Lampblack	.12 @14
Blue, Chinese	.36 @46
Blue, Prussian	.32 @36
Blue, Ultramarine	.13 @16
Brown, Vandyke	.11 @14
Green, Chrome	.12 @16
Green, Paris	@24
Sienna, Raw	.12 @15
Sienna, Burnt	.12 @15
Umber, Raw	.11 @14
Umber, Burnt	.11 @14

White Lead, Zinc, &c.— ℔ lb

Lead, English white, in Oil	9¾@10
Lead, American white, in Oil:	
Lots of 500 lb or over	@ 7¼
Lots less than 500 lb	@ 7¾
In Barrels	@ 6¾
Lead, White, in oil, 25 lb tin pails, add to keg price	@ ⅛
Lead, White, in oil, 12½ lb tin pails, add to keg price	@ 1
Lead, White, in oil, 1 to 5 lb ass'ted tins, add to keg price	@ 1½

Lead, American, Terms: For lots 12 tons and over ¼ ¢ rebate; and 2% for cash if paid in 15 days from date of invoice; for lots of 500 lbs. and over 2% for cash if paid in 15 days from date of invoice, for lots of less than 500 lbs. net.

Lead, White Dry, in bbls	6½@ 6¾
Zinc, American, dry	5¾@ 5½
Zinc, French:	
Antwerp, Red Seal, dry	8¾
Antwerp, Green Seal, dry	10¾
Paris, Red Seal, dry	9¾
Paris, Green Seal, dry	11

Zinc, V. M. French, in Poppy Oil:

Green Seal:	
Lots of 1 ton and over	13¼@13¾
Lots of less than 1 ton	13¾@13⅞

Zinc, V. M. French, in Poppy Oil:

Red Seal:	
Lots of 1 ton and over	11⅞@12¾
Lots of less than 1 ton	12¼@12¾

Discounts.—French Zinc.—Discounts to buyers of 10 bbl. lots of one or mixed grades, 1%; 25 bbls., 2%; 50 bbls., 4%.

Dry Colors— ℔ lb

Black, Carbon	5 @10
Black Drop, American	4 @ 6
Black Drop, English	5 @15
Black, Ivory	.16 @20
Lamp, Com	4 @ 6
Blue, Celestial	4 @ 6
Blue, Chinese	.29 @32
Blue, Prussian	.27 @30
Blue, Ultramarine	4½@15
Brown, Spanish	½@ 1
Carmine, No. 40	$2.95@3.05
Green, Chrome, ordinary	3½@ 6
Green, Chrome, pure	.17 @25

Lead, Red, bbls., ½ bbls. and kegs:

Lots 500 lb or over	@ 7¼
Lots less than 500 lb	@ 7¾
Litharge, American, bbls	7¼@ 7¾
Ocher, American	℔ ton $8.50@16.00
American Golden	2½@ 3½
French	1¾@ 2½
Foreign Golden	3 @ 4
Orange Mineral, English	.10 @12
French	10¾@12
German	8½@10
American	8½@ 8¾
Red, Indian, English	4½@ 8½
American	3 @ 3¼
Red, Turkey, English	4 @10
Red, Tuscan, English	7 @10
Red, Venetian, Amer.	℔ 100 lb $0.50@1.25
English	100 lb $1.15@1.75
Sienna, Italian, Burnt and Powdered	3 @ 9¼
Italian, Raw, Powdered	3 @ 6¼
American, Raw	1½@ 2
American Burnt and Pow	1½@ 2
Talc, French	℔ ton $17.00@25.00
American	℔ ton 17.00@25.00
Terra Alba, French	℔ 100 L .90@ 1.00
English	℔ 100 lb .80@ 1.00
American	℔ 100 lb, No. 1, .75@ .80
American	℔ 100 lb, No. 2, .60@ .65
Umber, Turkey, Burnt & Pow	2¼@ 3½
Turkey, Raw and Powdered	2½@ 3½
Burnt, American	1¼@ 2
Raw, American	1½@ 2
Yellow Chrome	.12 @14
Vermilion, American Lead	.10 @25
Quicksilver, bulk	.65 @..
Quicksilver, bags	@68
English, Import	.65 @70
Chinese	$0.90@1.00

THE IRON AGE

The oldest paper in the world devoted to the interests of the Hardware, Iron, Machinery and Metal Trades, and a standard authority on all matters relating to those branches of industry.

ISSUED EVERY THURSDAY MORNING.

Subscription, postpaid, $5.00 a year

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Pittsburgh,	Park Building, 357 Fifth Avenue.	ROBERT A. WALKER, Manager.
Chicago,	Fisher Building, Dearborn and Van Buren Streets,	A. A. AINSWORTH, Manager.
Cincinnati,	Pickering Building, Fifth and Main Streets,	HENRY SMITH, Manager.
Boston,	Compton Building, 161 Devonshire Street,	WALTER C. ENGLISH, Manager.
Cleveland	The Cuyahoga, 311 Superior Street	EZRA S. ADAMS, Manager.

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ENTERED AT THE POST OFFICE, NEW YORK, AS SECOND-CLASS MATTER

Current Hardware Prices.

General Goods.—In the following quotations General Goods—that is, those which are made by more than one manufacturer—are printed in *Italics*, and the prices named, unless otherwise stated, represent those current in the market as obtainable by the fair retail Hardware trade, whether from manufacturers or jobbers. Very small orders and broken packages often command higher prices, while lower prices are frequently given to larger buyers.

Special Goods.—Quotations printed in the ordinary type (Roman) relate to goods of particular manufacturers, who are responsible for their correctness. They usually represent the prices to the small trade, lower prices being obtainable by the fair retail trade, from manufacturers or jobbers.

Range of Prices.—A range of prices is indicated by means of the symbol @. Thus 33⅓ @ 33⅓ & 10% signifies that the price of the goods in question ranges from 33⅓ per cent. discount to 33⅓ and 10 per cent. discount.

Names of Manufacturers.—For the names and addresses of manufacturers see the advertising columns and also THE IRON AGE DIRECTORY, issued May, 1906, which gives a classified list of the products of our advertisers and thus serves as a DIRECTORY of the Iron, Hardware and Machinery trades.

Standard Lists.—A new edition of "Standard Hardware Lists" has been issued and contains the list prices of many leading goods.

Additions and Corrections.—The trade are requested to suggest any improvements with a view to rendering these quotations as correct and as useful as possible to Retail Hardware Merchants.

Adjusters, Blind—
Domestic, ₱ doz. $3.00.....33⅓%
North's 10%
Zimmerman's—See Fasteners, Blind.

Window Stop—
Ives' Patent.....35%
Taplin's Perfection.....35%

Ammunition— See *Caps, Cartridges, Shells, &c.*

Anvils—American—
Eagle Anvils.....₱ lb 7 @7¼¢
Hay-Budden, Wrought.....9½@9¾¢
Trenton .....₱ lb 9½@9¾¢

Imported—
Peter Wright & Sons, ₱ lb, 84 to 349 lb, 11¢; 350 to 600 lb, 11½¢.

Anvil, Vise and Drill—
Millers Falls Co., $18.00.....15&10%

Apple Parers— See *Parers, Apple, &c.*

Aprons, Blacksmiths'—
Livingston Nail Co.....33⅓%

Augers and Bits—
Com. Double Spur.....75@75&5%
Jennings Pat., reg. finish.....50&10&10@60%
Black Lip or Blued.....60&10%
Boring Mach. Augers.....70&10%
Car Bits, 12-in. twist.....50&10%
Ford's Auger and Car Bits.....40&5%
Forstner Pat. Auger Bits.....25%
C. E. Jennings & Co.:
No. 10 ext. lip, R. Jennings' list..25%
No. 30, R. Jennings' list.....40&7½%
Russell Jennings'.....25&10&2½%
L'Hommedieu Car Bits.....15%
Mayhew's Countersink Bits.....45%
Millers Falls.....50&10&7½%
Pugh's Black.....20%
Pugh's Jennings' Pattern.....35%
Snell's Auger Bits.....60%
Snell's Bell Hangers' Bits.....60%
Snell's Car Bits, 12-in. twist.....60%
Snell's King Auger Bits.....50%
Wright's Jennings' Bits.....50%

Bit Stock Drills—
See *Drills, Twist.*

Expansive Bits—
Clark's small, $18; large, $26.....50&10%
Clark's Pattern, No. 1, ₱ doz. $36; No. 2, $18.....60&10&10%
Ford's, Clark's Pattern.....60%
C. Jennings & Co., Steer's Pat..25%
Lavigne Pat., small size, $18.00; large size, $26.00.....70&10%
Swan's 60%

Gimlet Bits—
Per gro.
Common Dble. Cut....$3.00@3.25
German Pattern, Nos. 1 to 10, $4.60; 11 to 13, $5.75

Hollow Augers—
Bonney Pat., per doz..$5.50@6.00
Ames .....25&10%
Universal.....20%
Wood's Universal.....25%

Ship Augers and Bits—
Ship Augers.....45&5&5@—%
Ford's .....33⅓&5%
C. E. Jennings & Co.:
L'Hommedieu's 15%
Watrous' .....33⅓&7½%
Snell's 40%

Awl Hafts— See *Handles, Mechanics' Tool.*

Awls—
Brad Awls:
Handled .....gro. $2.75@3.00
Unhdled, Shldered...gro.63@66¢
Unhandled, Patent..gro.68@70¢
Peg Awls:
Unhandled, Patent..gro. $1@3½¢
Unhdled, Shldered..gro. 65@70¢
Scratch Awls:
Handled, Com...gro. $3.50@4.00
Handled, Socket..gro.$11.50@12.00

Awl and Tool Sets—See *Sets, Awl and Tool.*

Axes—
Single Bit, base weights:
First Quality.....$4.75@5.00
Second Quality.....$4.25@4.50
Double Bit, base weights:
First Quality.....$7.00@7.50
Second Quality.....$6.50@6.75

Axle Grease — See *Grease, Axle*

Axles— *Iron or Steel*
Concord, Loose Collar...4¼@4¾¢
Concord, Solid Collar...4¾@5¼¢
No. 1 Common, Loose...3¼@3½¢
No. 1½ Com., New Style3¾@4¼¢
No. 2 Solid Collar.....4@4½¢
Half Patent:
Nos. 7, 8, 11 and 12....75@75&5%
Nos. 13 to 14.....70&10@75&5%
Nos. 15 to 18...75&10@75&10&5%
Nos. 19 to 22...75&10@75&10&5%

Boxes, Axle—
Common and Concord, not turned lb., 4½@5¢
Common and Concord, turned. lb., 5½@6¢
Half Patent.....lb., 8½@9¢

Bait— Fishing—
Hendryx:
A Bait.....20%
B Bait.....25%
Competitor Bait.....20&5%

Balances— Sash—
Caldwell new list.....50%
Pullman .....50&10@60%

Spring—
Spring Balances.....50&10@60%
Chatillon's:
Light Spg. Balances.....50&10%
Straight Balances.....40&50%
Circular Balances.....50&10%
Large Dial.....30%

Barb Wire—See *Wire, Barb.*

Bars— Crow—
Steel Crowbars, 10 to 40 lb.... per lb., 3@3½¢

Towel
No. 10 Ideal, Nickel Plate..₱ gro. $8.50

Beams, Scale—
Scale Beams.....40&5@40&10%
Chattillon's No. 1.....30%
Chattillon's No. 2.....40%

Boaters, Carpet—
Holt-Lyon Co.:
No. 13 Wire Tinned ₱ doz.....$0.75
No. 12 Wire Coppered ₱ doz, $0.75; Tinned $0.85
No. 11 Wire Coppered ₱ doz. $1.10; Tinned $1.20
No. 10 Wire Galvanized..₱ doz. $1.50
Western W. G. Co.:
No. 1 Electric.....₱ gro. $7.80
No. 2 Buffalo.....₱ gro. $9.00
No. 3 Perfection Dust.....₱ gro. $8.00

Egg—
Holt-Lyon Co.:
Holt, per doz., No. 5, $0.80; No. 1, Jap'd, $1.15; No. 1, Tin'd, $1.40; No. B, Jap'd, $1.85; No. 2, Tin'd, $2.25; No. 6, $1.60.
Lyon, Jap'd, per doz., No. 2, $1.35.
Taplin Mfg. Co.:
Improved Dover, per gro., No. 60, $6.00; No. 75, $6.50; No. 100, $7.00; No. 102, Tin'd, $8.50; No. 150, Hotel, $15.00; No. 152, Hotel Tin'd, $17.00; No. 200, Tumbler, $8.50; No. 202, Tumbler Tin'd, $9.50; No. 300, Mammoth, per doz., $25.00.
Turner & Seymour Mfg. Co.:
T. & S. Dover.....$6.00
Western, W. G. Co. ₱ gro., Buffalo, No. 2, $8.00; Perfection, No. 3, $9.00.
Wonder (R M. Co.)..₱ gro. net, $6.25

Bellows—
Blacksmith, Standard List.. 60&10@60&10&5%

Hand—
Inch.. 6 7 8 9 10
Doz..$4.75 5.70 6.65 7.60 8.85

Molders—
Inch.. 9 10 11 12 14
Doz..$8.00 9.00 10.50 12.50 14.50

Net Prices.

Bells— Cow—
Ordinary Goods...75&5@75&10&5%
High grade.....70&10@75%
Jersey .....75&10%
Texas Star.....50%

Door—
Alibe's Gong.....45%
Barton Gong.....50%
Home, R. & E. Mfg. Co.'s.....55&10%
Trip Gong.....50&10@50&10&5%
Yankee Gong.....55%

Hand—
Polished, Brass.....60&10%
White Metal.....60%
Nickel Plated.....50&10@60%
Swiss .....60@60&7½%
Cone's Globe Hand Bells.....33⅓@35%
Silver Chime.....33⅓@35%

Miscellaneous—
Farm Bells.....lb., 2¼@2½¢
Church and School.....60%
American Tube & Stamping Co. Gongs 10%
Table Call Bells.....50@50&10%

Belting— Leather—
Extra Heavy, Short Lap..60&5%
Regular Short Lap....60&10&5%
Standard 70%
Light Standard.....70&5%
Cut Leather Lacing.....45%
Leather Lacing Sides, per sq. ft. 25¢

Rubber—
Agricultural (Low Grade).... 75@75&5%
Common Standard....70@70&10%
Standard .....60&5@60&10%
Extra .....60@60&5%
High Grade.....50&5@50&10%

Bench Stops— See *Stops, Bench*

Benders and Upsetters, Tire—
Detroit Perfected Tire Bender.....40%
Detroit Stoddard's Lightning Tire Upsetters, No. 1, $4.25; No. 2, $7.25; No. 3, $10.50; No. 4, $16.25; No. 5, $20.50.
Green River Tire Benders and Upsetters 20%

Bicycle Goods—
John S. Leng's Son & Co.'s 1906 list: Chain, Parts, Spokes.....50% Tubes 60%

Bits—
Auger, Gimlet, Bit Stock Drills, &c.—See *Augers and Bits.*

Blocks— Tackle—
Common Wooden.....75%
Hartz St. Tackle Blocks.....50@50&5%
B. & L. B. Co.:
Boston Wood Snatch, 50%; Eclipse Steel, 75%; Hollow Steel, 50&10%; Star Wire Rope, 50%; Tarbox Metal Snatch, 50%; Tarbox New Style Steel, 50&10%; Wire Rope Snatch, 50%.
Lane's Patent Automatic Lock and Junior 30%
Stowell's Novelty, Mal. Iron.....50%
Stowell's Loading.....50&10%
See also Machines, Hoisting.

Boards, Stove—
Zinc, Crystal, &c.....40%
Paper Embossed.....40&10%

Boards, Wash— See *Washboards.*

Bobs, Plumb—
Keuffel & Esser Co.....33⅓%

Bolts—
Carriage, Machine, &c.—
Common Carriage (cut thread); ⅜ × 6 and smaller.....75@—%
Larger and Longer..... 60&10@60&10&5%
Phila. Eagle $3.00 list May 2½,'99 40%
Bolt Ends.....65@65&5%
Machine, ⅜ x 4 and smaller.. 75@—%
Machine, larger and longer.. 65@65&5%

Door and Shutter—
Cast Iron Barrel, Japanned, Round Brass Knob:
Inch..... 3 4 5 6 8
Per doz..$1.30 .35 .45 .60 .80
Cast Iron Spring Foot, Jap'd:
Inch..... 6 8 10
Per doz.....$1.20 1.50 2.25
Cast Iron Chain, Flat, Japanned:
Inch..... 6 8 10
Per doz.....$1.00 1.40 1.85
Cast Iron Flat Shutter, Jap'd., Brass Knobs:
Inch..... 6 8 10
Per doz.....$0.75 .95 1.25
Wrought Barrel Jap'd..80@80&10%
Barrel Bronzed.....50@50&10%
Spring .....70&10@70&10&10%
Shutter .....50&5@50&10&5%
Square Neck.....75@75&10%
Square ...66⅔&10@66⅔&10&10%
Ives' Patent Door.....50%

Plow and Stove—
Plow .....65&10@—
Stove .....82½&10

Tire—
Common Iron.....80%
Norway Iron.....80%
American Screw Company:
Norway Phila., list Oct. 16, '84...80%
Eagle Phila., list Oct. 16, '84...82½%
Bay State, list Dec. 28, '99.....80%
Franklin Moore Co.:
Norway Phila., list Oct. 16, '84...80%
Eagle Phila., list Oct. 16, '84...82½%
Eclipse, list Dec. 28, '99.....80%
Mount Carmel Bolt Co.:
Norway Phila., list Oct. 16, '84...80%
Eagle Phila., list Oct. 16, '84...82½%
Mount Carmel, list Dec. 28, '99...80%
Russell, Burdsall & Ward Bolt & Nut Co.:
Empire, list Dec. 28, '99.....80%
Norway Phila., list Oct., '84.....80%
Upson Nut Co.:
Tire Bolts.....72½%

Borers, Tap—
Borers Tap, Ring, with Handle:
Inch..... 1¼ 1½ 1¾ 2
Per doz...$4.80 5.60 6.40 8.00
Inch 2¼ 2½
Per doz..... $6.65 11.50
Enterprise Mfg. Co., No. 1, $1.25; No. 2, $1.65@$1.75; No. 3, $2.50 each...25%

Boxes, Mitre—
C. E. Jennings & Co.....30%
Langdon, New Langdon and Langdon Improved, 20&10%; Langdon Acme .....15&10%
Perfection 40%
Seavey 40%
Stanley R. & L. Co.: Nos. 240 to 460, 30%; Nos. 50 and 60.....35%

Braces—
Comm'n Ball, American..$1.25@1.30
Barber's .....50&10&10@60&10%
Fray's Genuine Spofford's.....60%
Fray's No. 70 to 120, 81 to 123, 207 to 414 .....60%
C. E. Jennings & Co.....50&5%
Mayhew's Ratchet.....60%
Mayhew's Quick Action Hay Pat...50%
Millers Falls Drill Braces.....25&10%
P., S. & W. Co., Peck's Pat.60@60&5%
Stanley R. & L. Co.:
Stanley, 35%; Victor.....45%

Brackets—
Wrought Steel.....80@80&5%
Griffin's Pressed Steel.....80@80&5%
Griffin's Folding Brackets.....70&10%
Stowell's Cast Shelf, 75%; Sink...50%
Western, W. G. Co., Wire.....60&10%

Bright Wire Goods— See *Wire and Wire Goods.*

Broilers—
Kilbourne Mfg. Co.....75&20%
Western, W. G. Co.....80%
Wire Goods Co.....75@75&10%

Buckets, Galvanized—
Price per dozen.

Quart	10	12	14
Water, Regular	*1.50*	*1.70*	*1.90*
Water, Heavy	*3.40*	*3.70*	*3.80*
Fire, Rd. Bottom	*2.30*	*2.55*	*2.95*
Well	*2.55*	*2.87*	*3.15*

Bucks, Saw—
Hoosier.....₱ gro. $36.00

Bull Rings—See *Rings, Bull*

Butts— Brass—
Wrought, list, Sept., '96. 75@—%
Cast Brass, Tiebout's.....50%

Cast Iron—
Fast Joint, Broad....40&10@50%
Fast Joint, Narrow....40&10@50%
Loose Joint.....70&10@75%
Loose Pin.....70&10@75%
Mayer's Hinges.....70@70&5%
Parliament Butts.....70@70&5%

Wrought Steel—
Discount.
Reversible and Broad..75&5%
Light Reversible, Light Narrow .....75&10%
Loose Joint, Narrow, L't Inside Blind, etc....75%
Back Flaps, Table, Chest. .....70&10%

Extra, Dec. 19th, 1906.

Cages, Bird—
Hendryx Brass: Series 3000, 5000, 7000, 5%; 1200, 33⅓%; 200, 300, 600, 900 .....40&10%
Hendryx Bronze: Series 700, 800 .....40&10%
Hendryx Enameled.....40&10%

Calipers—See *Compasses.*

Calks, Toe and Heel—
Blunt, 1 prong.....per lb., 4@4¼¢
Sharp, 1 prong...per lb., 4½@4¾¢
Burke's Blunt, 4@4¼¢; Sharp, 4½@4¾¢

Gautier, Blunt, 4@4¼¢; Sharp 4½@4¾¢
Perkins', Blunt, ℔ lb, 3.65¢; Sharp, 4.15¢

Can Openers—
See *Openers, Can.*

Cans, Milk—

	5	8	10 gal.
Illinois Pattern	$1.35	1.85	2.05 each.
New York Pattern	1.50	2.20	2.45 each.
Baltimore Pattern	1.50	2.20	2.45 each.
Dubuque	1.35	1.60	1.75 each.

Cans, Oil—

Buffalo Family Oil Cans:

3	5	10 gal.
$18.00	60.00	129.60 gro., net.

Caps, Percussion—

Eley's E. B.....52@55¢
G. D.....per M 34@35¢
F. L.....per M 40@42¢
G. E.....per M 48@50¢
Musket.....per M 62@63¢

Primers—

Berdan Primers, $2 per M...80%
B. L. Caps (Sturtevant Shells) $2 per M.....80%
All other primers per M.$1.52@1.60

Cartridges—

Blank Cartridges:
32 C. F., $5.50.....10&5%
38 C. F., $7.00.....10&5%
22 cal. Rim, $1.50.....10&5%
32 cal. Rim, $2.75.....10&5%
B. B. Caps, Con. Ball, Swgd..$1.90
B. B. Caps, Round Ball....$1.40
Central Fire.....25%
Target and Sporting Rifle..15&5%
Primed Shells and Bullets.15&10%
Rim Fire, Sporting.....50%
Rim Fire, Military.....15&5%

Casters—

Bed.....70@70&10%
Plate.....60&10@60&10&5%
Philadelphia.....75@75&10%
Acme, Ball Bearing.....33⅓%
Boss.....70&10%
Boss Anti-Friction.....70&10%
Gem (Roller Bearing).....80%
Martin's Patent (Phoenix).....45%
Standard Ball Bearing.....45%
Tucker's Patent low list.....30%
Yale (Double Wheel) low list.....50%

Cattle Leaders—
See *Leaders, Cattle.*

Chain, Coil—

American Coil, Straight Link:

5-16	¼	5-16	⅜	7-16	½	9-16
$3.70	5.90	4.95	4.20	4.05	3.95	3.90
⅝	¾	⅞ to 1		1⅛ to 1¼ inch.		
$3.85	3.70	3.65		3.80		

German Coil.....60&10&10@70%

Halter—

Halter Chains.....60&5@60&10%
German Pattern Halter Chains, list July 24, '97.....60&10&10%
Covert Mfg. Co.
Halter.....35&5%

Cow Ties—
See *Halters and Ties.*

Trace, Wagon, &c.—

Traces, Western Standard: 100 pr.
6½—6-3, Str'ght, with ring $25.00
6½—6-2, Str'ght, with ring $26.00
6½—8-2, Str'ght, with ring $30.00
6½—10-2, Str'ght, with ring $35.00

NOTE.—Add 2c per pair for Hooks. Twist Traces; add per pair for Nos. 2 and 3, 2c; No. 1, 3c; No. 0, 4c to price of Straight Link.

Eastern Standard Traces, Wagon Chain, &c.....60&10%

Miscellaneous—

Jack Chain, list July 10, '93:
Iron.....60&10%
Brass.....60&10%
Safety Chain.....70&10%
Gal. Pump Chain.....lb. 4@4½%
Covert Mfg. Co.:
Breast, Halter, Heel, Rein, Stallion.....40%
Oneida Community:
Am. Dog Leads and Kennel Chains, 40@40&5%
Niagara Dog Leads and Kennel Chains.....45@60&5%
Wire Goods Co.:
Dog Chain.....70&10%
Universal Dbl.-Jointed Chain.....50%

Chain and Ribbon, Sash—

Oneida Community:
Copper Chain, 60&5%; Steel Chain, 60%
Pullman:
Bronze Chain, 60%; Steel Chain, 60&10%
Sash Chain Attachments, per set .8¢
Aluminoy Sash Ribbon, per 100 ft.....$1.25@$3.00
Sash Ribbon Attachments, per set .8¢

Chalk—(From Jobbers.)

Carpenters' Blue....gro., 45@—¢
Carpenters' Red.....gro., 40@—¢
Carpenters' White...gro., 35@—¢
Some jobbers sell at lower prices than above.

Checks, Door—

Bardsley's.....45%
Pullman, per gro.....$54.00
Russwin.....40%

Chests, Tool—

American Tool Chest Co.:
Boys' Chests, with Tools.....5%
Youths' Chests, with Tools.....40%
Gentlemen's Chests, with Tools..30%
Farmers', Carpenters,' etc., Chests, with Tools.....20%
Machinists' and Pipe Fitters' Chests, Empty.....50%
Tool Cabinets.....50%
C. E. Jennings & Co.'s Machinists' Tool Chests.....33⅓&10%

Chisels—
Socket Framing and Firmer

Standard List...75&10@75&10&5%
Buck Bros.....30%
Charles Buck Edge Tool Co.....30%
C. E. Jennings & Co.:
Socket Firmer No. 10.....60%
Socket Framing No. 15.....60%
Swan's.....75%
L. & I. J. White Co.....30@30&5%

Tanged—

Tanged Firmers.....33 1-3@40%
Buck Bros.....30%
Charles Buck Edge Tool Co.....30%
C. E. Jennings & Co. Nos. 191, 181..25%
L. & I. J. White Co.....25&5%

Cold—

lb.

Cold Chisels, good quality..13@15¢
Cold Chisels, fair quality..11@12¢
Cold Chisels, ordinary... 9@10¢

Chucks—

Almond Drill Chucks.....35%
Almond Turret Six-Tool Chuck....35%
Beach Pat., each $8.00.....35&5%
Empire.....25%
Blacksmiths'.....25%
Jacobs' Drill Chucks.....35%
Pratt's Positive Drive.....25%
Skinner Patent Chucks:
Independent Lathe Chucks.....40%
Universal, Reversible Jaws.....40%
Combination, Reversible Jaws....40%
Drill Chucks, New Model, 25%; Standard, 40&10%; Skinner Pat., 25%; Positive Drive.....40%
Planer Chucks.....30%
Face Plate Jaws.....40%
Standard Tool Co.:
Improved Drill Chuck.....45%
Union Mfg. Co.:
Combination, Nos. 1, 2, 3, 4, 5, 6, 7, 8 and 17, 40%; No. 21.....35%
Scroll Combination, Nos. 82 and 84.....30%
Geared Scroll, Nos. 33, 34 and 35..35%
Independent Iron, Nos. 18 and 318.10%
Independent Steel, No. 61.....30%
Union Czar Drill, Nos, 000, 101, 103.....35%
Universal 11, 12, 16, 17, 13, 14, 15..40%
Universal, No. 42.....35%
Iron Face Plate Jaws, Nos. 28, 30, 48 and 50.....40%
Steel Face Plate Jaws, Nos. 70 and 72.....35%
Westcott Patent Chucks:
Lathe Chucks.....50%
Little Giant Auxiliary Drill.....50%
Little Giant Double Grip Drill..50%
Little Giant Drill, Improved.....50%
Oneida Drill.....50%
Scroll Combination Lathe.....50%

Clamps—

Adjustable, Hammers'.....20@20&5%
Carriage Makers', P., S. & W. Co.....40&10@50%
Besly, Parallel.....33⅓&10%
Lineman's, Utica Drop Forge & Tool Co.'s.....40%
Wood Workers, Hammers'.....40&10%
Saw Clamps, see Vises, Saw Filers'.

Cleaners, Drain—

Iwan's Champion, Adjustable.....55%
Iwan's Champion, Stationary.....45%

Sidewalk—

Star Socket, All Steel..℔ doz. $4.05 net
Star Shank, All Steel..℔ doz. $3.24 net
W. & C. Shank, All Steel, ℔ doz., 7½ in., $3.00; 8 in., $3.25.

Cleavers, Butchers'—

Foster Bros.....30%
Fayette R. Plumb.....30%
L. & I. J. White Co.....30%

Clippers, Horse and Sheep—

Chicago Flexible Shaft Company:
'98 Chicago Horse, each....$8.75
1902 Chicago Horse, each..$10.75
20th Century Horse, each..$5.00
Lightning Belt Horse, each.$15.00
Chicago Belt Horse, each.$20.00
Stewart's Enclosed Gear Horse, each.....$6.75
Stewart's Patent Sheep Shearing Machine, each.....$12.75
} 20%

Clips, Axle—

Regular Styles, list July 1, '05.80%

Cloth and Netting, Wire—See *Wire, &c.*

Cocks, Brass—

Hardware list:
Plain Bibbs, Globe, Kerosene, Racking, Liquor, Bottling, &c.....70%
Compression Bibbs.....65&10%

Coffee Mills—
See *Mills, Coffee.*

Collars, Dog—

Nickel Chain, Walter B. Stevens & Son's list.....40%
Leather, Walter B. Stevens & Son's list.....40%

Combs, Curry—

Metal Stamping Co.....40%

Compasses, Dividers, &c.

Ordinary Goods.....70&10@75%
Bemis & Call Hdw. & Tool Co.:
Dividers.....65%
Calipers, Double, 65%; Inside or Outside.....65%
Calipers, Wing.....60%
Compasses.....50%
Wm. Schollhorn Co.:
Excelsior Dividers.....55%
Lodi Dividers.....75%

Conductor Pipe,—

L. C. L. to Dealers:

Territory:	*Galvanized Steel.*	*Charcoal Iron.*	*Copper. 14, 16&20 oz.*
Eastern:			
	60&30%	60&2½%	40&10%
Central:			
	70%	55&7½%	40&7½%
Western and Southern:			
	65&10%	55&2½%	40&5%
So. Western			
	62½&7½%	50&5%	40&2½%

Terms, 60 days; 2% cash 10 days. Factory shipments generally delivered.
See also Eave Troughs.

Coolers, Water—

Gal, each..	2	3	4	6	8
Labrador	$1.20	$1.50	$1.80	$2.10	$2.70
Gal.	3	4	6	8	
Iceland, ea.	$1.80	$2.10	$2.40	$3.00	
Gal.	2	3	4	6	8
Galvanized, ea.	$1.85	$2.00	$2.25	$2.90	$3.90
Galvanized, Lined, side handles, Gal.	2	3	4	6	8
Each	$1.95	$2.15	$2.40	$3.30	$4.15
White Enameled, 25%; Agate Lined.25%					

Coopers' Tools—
See *Tools, Coopers'.*

Coppers' Soldering—

Soldering Coppers, 3 lbs. to pair and heavier, 23¢; lighter than 3 lb. to pair.....25¢

Cord— Sash—

Braided, Drab.....lb. 35¢
Braided, White, Com., Nos. 8 to 12, 2¼¢; No. 7, 2½¢; No. 6, 2¾¢.
Cable Laid Italian.....
lb., A, 18¢; B, 16¢
Common India.....lb. 10@10½¢
Cotton Sash Cord, Twisted..17@19¢
Patent Russia.....lb...@14¢
Cable Laid Russia....lb...@15¢
India Hemp, Br'd'd..lb.18@18½¢
India Hemp, Twisted..lb. 12@13¢
Patent India, Twisted.lb. 12@13¢
Anniston Cordage Co.: ℔ lb, solid Braided, Nos. 8 to 12, $0.24; No. 7, $0.24½; No. 6, $0.25½; ℔ doz., 50 ft, Oriole, $2.00; 50 ft., Columbia, $0.85; 50 ft., Victors, $1.00; 50 ft., 6-Thread, $1.10; 60 ft., 3-Thread, $0.95; 50 ft., Manila, $1.40; 60 ft., Jute, $0.75.
Pearl Braided, cotton, No. 6, ℔ lb, 25½¢; No. 7, 25¢; Nos. 8 to 12, 24½¢
Eddystone Braided, Nos. 8, 9 and 10, 25¢; 7, 25½¢; 6, 26½¢.
Harmony Cable Laid Italian, Nos. 7 to 10.....℔ lb 23 ¢
Pullman:
Wire Sash Cord.....18%
Sash Cord Attachments, per doz.10¢
Samson, Nos. 8 to 12:
Braided, ℔ lb., Drab Cotton, 55¢; Italian Hemp, 40¢@50¢; Linen, 65¢; White Cotton, 50¢; Spot Cord.....50¢
Massachusetts, White....℔ lb 40¢
Massachusetts, Drab....℔ lb 45¢
No. 7, 28¢; No. 6, 30¢.
Phoenix, White, Nos. 8 to 12, 27¢;
Silver Lake, per lb.:
A, Drab, 45¢; A, White, 40¢; B, Drab, 40¢; B, White, 35¢; Italian Hemp, 40¢; Linen....57½¢
} 15&10%
See also Chain and Ribbon.

Wire, Picture—

List July 19, 1906..85¢10¢10¢—
Hendryx Standard Wire Picture Cord, old list, 85&10%

Cradles—

Grain.....40&12½%

Crayons—

White Round Crayons, Cases, 100 gro., $6.50@$7.50 at factory, but lower prices made by jobbers
Zelnicker's Lumber.
℔ gro.
White and Purple, Indelible....$7.50
Blue, Red, Green, Yellow and Terra Cotta, $6.50; Black.....$4.00
Genuine Soapstone, Metal Workers', 5 in. x ¾ in. Round, $2.50; 5 in. x ¾ in. Square, $1.75; 5 x ½ x 3-16, $2.50; 5 x 1¼ x 3-16.....$3.00

Crooks, Shepherds'—

Fort Madison, per doz., Heavy, $7.00; Light.....$6.50

Crow Bars—See *Bars, Crow.*

Cultivators—

Victor Garden.....50%

Cutlery, Table—

International Silver Company:
No. 12 M'd'm Knives, 1847, ℔ doz. $3.50
Star, Eagle, Rogers & Hamilton and Anchor.....℔ doz. $3.00
Wm. Rogers & Son.....℔ doz. $2.50

Cutters— Glass—

H. H. Mayhew Co.....40%
Red Devil.....50%
Smith & Hemenway Co.....50%
Woodward.....40%

Meat and Food—

American.....30%

Nos.	1	2	3	4	5	6
Each	$5	$7	$10	$25	$50	$60

Enterprise:

Nos.	5	10	12	22	32	
Each	$2	$3	$2.75	$1.50	$6	25@25&7½%

No. 202, $1.50.....40&7½%
Dixon's.....℔ doz. 40@50%

Nos.	1	2	3	4
	$14.00	$17.00	$19.00	$30.00

Ideal.....40&10@50%
Little Giant.....℔ doz. 40@50%

Nos.	305	310	312	320	322
	$35.00	$48.00	$44.00	$72.00	$68.00

N. E. Food Choppers.....25%
New Triumph No. 605, ℔ doz. $24.00.....40@50%
Russwin Food. No. 1, $24.00; No. 2, $27.00.....45&10&10%
Woodruff's.....℔ doz. 40@50%

Nos.	100	150
	$15.00	$18.00

Enterprise Beef Shavers.....25@30%

Slaw and Kraut—

Henry Disston & Sons:
Slaw and Kraut Cutters, Corn Graters, &c.....35%
J. M. Mast Mfg. Co.:
Slaw Cutters, 1 Knife....℔ doz. $3.00
Combined Slaw Cutter and Corn Grater.....℔ doz. $4.00
Tucker & Dorsey Mfg. Co.:
Kraut Cutters.....40%
Slaw Cutters, 1 Knife..℔ gr. $18@$20
Slaw Cutters, 2 Knife..℔ gr. $22@$36

Tobacco—

All Iron, Cheap..*doz. $4.25@$4.50*
Enterprise.....25@30%
National, ℔ doz., No. 1, $21; No. 2, $18.....40%

Diggers, Post Hole, &c.—

Disston's:
Rapid, ℔ doz., $24.00.....25%
Samson, ℔ doz., $34.00.....25%
Iwan's Improved Post Hole Auger.40&5%
Vaughan Pattern Post Hole Augers.
℔ doz., $6.25
Perfection Post Hole Diggers, ℔ doz.....$8.25
Split Handle Post Hole Diggers, ℔ doz. $7.25
Kohler's, ℔ doz., Universal, $14.00; Little Giant, $12.00; Hercules, $10.00; Invincible, $9.00; Rival, $8.00; Pioneer.....$7.00
Never-Break Post Hole Diggers, ℔ doz., $24.00.....60%

Dividers—See *Compasses.*

Drawers, Money—

Tucker's Pat. Alarm Till No. 1, ℔ doz., $18; No. 2, $15; No. 3, $12; No. 4, $18.

Drawing Knives—
See *Knives, Drawing.*

Dressers, Emery Wheel—

Diamond Emery Wheel Dressers....35%
Diamond Wheel Dresser Cutters....35%

Drills and Drill Stocks—

Blacksmiths' Common Drilling Machines.....$1.50@$1.75
Breast, Millers Falls.....
Breast, P., S. & W.....40%
Goodell Automatic Drills..40&5@40&10%
Johnson's Automatic Drills, Nos. 2 and 3.....16⅔%
Johnson's Drill Points.....16⅔%
Millers Falls Automatic Drills.33⅓&10%
Ratchet, Curtis & Curtis.....25%
Ratchet, Parker's, 40%; Weston's..40%
Ratchet, Weston's, Style H Improved.....40%
Ratchet, No. 012.....40%
Ratchet, Whitney's, P., S. & W..50%
Whitney's Hand Drill, No. 1, $10.00; Adjustable, No. 10, $12.00.....33⅓%

Twist Drills—

Bit Stock.....60&10&10@70%
Taper and Straight Shank.....
60&10@60&10&5%

Drivers, Screw—

Screw D'vers Bits, per doz..45@50¢
Balsey's Screw Holder and Driver, ℔ doz., 2½-in., $6; 4-in., $7.50; 6-in., ℔.....50%
Buck Bros.' Screw Driver Bits.....30%
Champion.....50%
Disston's.....70%
Edson.....60%
Fray's Hol. H'dle Sets, No. 3, $12..50%
Ford's Brace Screw Drivers....40&10%
Gay's Double Action Ratchet.....35%
Goodell's Auto..50&10&10@50&10&10&5%
Hurwood.....40%
Mayhew's Black Handle.....40%
Mayhew's Monarch.....40&10%
Millers Falls, Nos. 20 and 21...25&10%
Millers Falls, Nos. 11, 12, 41, 42..15&10%
New England Specialty Co.....50&10%
Smith & Hemenway Co., Neverturn, 40&5%; Elmora.....50%
H. D. Smith & Co.'s Perfect H'dle.40%
Stanley R. & L. Co.'s:
No. 64, Varn, Handles, 65%; No. 66, 75%; Victor, 55%; Defiance..70%
Swan's:
Nos. 7565 to 7568, 50%; No. 7540, 40&10%

Eave Trough, Galvanized—

Territory.	*L. C. L. Galvanized Steel.*	*Charcoal Iron.*	*Copper. 14, 16&20 oz.*
Eastern:			
	80%	70&5%	40&10%
Central:			
	75&10&7½%	70%	40&7½%
Western and Southern:			
	70&20&7½%	60&15&2½%	40&5%
So. Western:			
	70&20%	65&2½%	40&2½%

Terms,—2% for cash. Factory shipments generally delivered.
See also Conductor Pipe and Elbows.

Elbows and Shoes—

Factory shipments, all territories: Galv. Steel and Galv. C. I.
Standard Gauge.....60&10%
No. 26.....50%
No. 24.....25%
No. 22.....10%
Copper.....50%

Elbows, Stove Pipe—

Dover, One piece (R. M. Co.)....40&10%
Perfect Elbows.....40%

Emery, Turkish—

	¼ to ½:	5½ to 22c:	Flour.
Kegs.....lb.	5 ¢	5½ ¢	3½ ¢
½ Kegs.....lb.	5¼ ¢	5¾ ¢	3¾ ¢
¼ Kegs.....lb.	5½ ¢	6 ¢	4 ¢
10-lb. cans, 10 in case....6½¢	7 ¢	6 ¢	
10-lb. cans, less than 10.....	10 ¢	10 ¢	8 ¢
Less quantity..	10 ¢	10 ¢	8 ¢

NOTE.—In lots 1 to 3 tons a discount of 10% is given.

Extractors, Lemon Juice

Fasteners, Blind—
—See *Squeezers, Lemon.*

Zimmerman's .....50&10%
Waling's .....40&10%

Cord and Weight—
Ives 33⅓%

Faucets—
Cork Lined.....50@50&10%
Metallic Key, Leather Lined..60&10@70%
Red Cedar.....40&10@50%
Petroleum.....70&10@75%
B. & L. B. Co.:
Metal Key.....60&10%
Star 60%
West Lock.....50&10%
John Sommer's Peerless Tin Key....50%
John Sommer's Boss Tin Key.....50%
John Sommer's Victor Mtl. Key..50&10%
John Sommer's Duplex Metal Key..60%
John Sommer's Diamond Lock.....40%
John Sommer's I.X.L. Cork Lined..50%
John Sommer's Reliable Cork Lined..50&10%
John Sommer's Chicago Cork Lined.60%
John Sommer's O. K. Cork Lined...50%
John Sommer's No Brand, Cedar....50%
John Sommer's Perfection, Cedar....40%
McKenna, Brass:
Burglar Proof, N. P.....25%
Improved, ⅝ and ¾ inch.....25%
Self Measuring:
Enterprise, ℔ doz. $36.00.....40&10%
Lane's, ℔ doz. $36.00.....40&10%
National Measuring, ℔ doz. $36.40&10%

Felloe Plates—
See *Plates, Felloe.*

Files— Domestic—
List Nov. 1, 1899.
Best Brands.....70&10@75&10%
Standard Brands.75&10@75&10&10%
Lower Grade....75&10&10@80&10%

Imported—
Stubs' Tapers, Stubs' list, July 24, '97.....33 1-3@40%

Fixtures, Fire Door—
Richards Mfg. Co.:
Universal, No. 103; Special, No. 104 .....$3.75
Fusible Links, No. 96.....50%
Expansion Bolts, No. 107.....60&10%

Grindstone—
Net Prices:

	Inch	*15*	*17*	*19*	*21*
Per doz.....		$3.25	3.75	4.25	4.75

P., S. & W. Co.....30&10@40%
Reading Hardware Co.....60%
Stowell's Giant Grindstone Hanger.. ℔ doz. $6.00
Stowell's Grindstone Fixtures, Extra Heavy, 40&10%; Light.....50%

Fodder Squeezers—
See *Compressors.*

Forks—
NOTE.—Manufacturers are selling from the list of September 1, 1904, but many jobbers are still using list of August 1, 1899, or selling at net prices.
Iowa Dig-Eze Potato.....60&10%
Victor, Hay.....60&15&2½%
Victor, Manure.....60%
Victor, Header.....65%
Champion, Hay.....60%
Champion, Header.....65%
Champion, Manure.....60&15&2½%
Columbia, Hay.....60&20%
Columbia, Manure.....70%
Columbia, Spading.....70&12½%
Hawkeye Wood Barley.....40%
W. & C. Potato Digger.....60&10%
Acme Hay.....60&20%
Acme Measure, 4 tine.....60&10&5%
Dakota Header.....60&20%
Jackson Steel Barley.....60&20%
Kansas Header.....65%
W. & C. Favorite Wood Barley.....40%
Plated.—See Spoons.

Frames— Saw—
White, S'g't Bar, per doz..75@80¢
Red, S'g't Bar, per doz...$1.00@1.25
Red, Dbl. Brace, per doz.$1.40@1.50

Freezers, Ice Cream—

Qt.	*1*	*2*	*3*	*4*	*6*
Each	$1.30	$1.60	$1.90	$2.20	$2.80

Fruit and Jelly Presses—
See *Presses, Fruit and Jelly.*

Fry Pans—See *Pans, Fry.*

Fuse—
Per 1000 Feet.
Hemp $2.75
Cotton 3.20
Waterproof Sgl. Taped.. 3.65
Waterproof Dbl. Taped.. 4.40
Waterproof Tpl. Taped.. 5.15
10&5&2½%

Gates, Molasses and Oil—
Stebbins' Pattern.....80&10%

Gauges—
Marking, Mortise, &c..50@50&10%
Chapin-Stephens Co.:
Marking, Mortise, &c.....50&50&10%
Scholl's Patent.....50&10@50&10&10%
Door Hangers.....50@50&10%
Disston's Marking, Mortise, &c..67½%
Stanley R. & L. Co.'s Butt and Rabbet Gauge.....35%
Marking and Mortise.....55%
Wire, Brown & Sharpe's.....25%
Wire, Morse's.....35%
Wire, P., S. & W. Co.....33⅓%

Gimlets— Single Cut—
Numbered assortments, per gro.
Nail, Metal, No. 1, $2.00; 2, $2.30
Spike, Metal, No. 1, $4.00; 2, $4.30
Nail, Wood Handled, No. 1, $2.30; 2, $2.60
Spike, Wood Handled, No. 1, $4.30; 2, $4.60

Glass, American Window
See *Trade Report.*

Glasses, Level—
Chapin-Stephens Co.....60@60&10%

Glue, Liquid Fish—
Bottles or Cans, with Brush..25&10@50%
International Glue Co. (Martin's)..40%

Grease, Axle—
Common Grade....gro. $4.50@6.00
Dixon's Everlasting, 10-lb pails, ea. 85¢; in boxes, ℔ doz., 1 lb. $1.20; 2 lb.....$2.00
Helmet Hard Oil.....25%

Griddles, Soapstone—
Pike Mfg. Co.....33⅓@33⅓&10%

Grindstones—
Bicycle Emery Grinder.....$6.50
Bicycle Grindstones, each.....$2.50@3.00
Pike Mfg. Co.:
Improved Family Grindstones, per inch, ℔ doz.....$2.00 } 25
Pike Mower and Tool Grinder, each.....$6.00 } 33⅓
Royal Mfg. Co.:
Alundum Grinding Machines, each, Nos. 01, $1.75; 1A, $2.50; 10, $5.00 .....30%
Alundum Sickle Grinders, each, Nos. 20A, $6.00; 20A Combined, $6.50 .....30%
Alundum Disc Grinders, each, $2.50 .....30%

Grips, Nipple—
Perfect Nipple Grips.....40&10&2%

Halters and Ties—
Cow Ties.....60&10@60&10&5%
Covert Mfg. Co.:
Web 45%
Jute Rope.....45%
Sisal Rope.....33⅓%
Cotton Rope.....45%
Hemp Rope.....45%
Oneida Community:
Am. Coil and Halters.....40@40&5%
Am. Cow Ties.....45@50%
Niagara Coil and Halters..45@50&5%
Niagara Cow Ties....45&5@50&10&5%

Hammers—
Handled Hammers—
Heller's Machinists'...40&10@40&10&10%
Heller's Farriers.....40&10@40&10&10%
Magnetic Tack, Nos. 1, 2, 3, $1.25, $1.50, $1.75.....50%
Peck, Stow & Wilcox, Steel.....60%
Fayette R. Plumb:
Plumb, A. E. Nail..... 33⅓&7½@33⅓&10&7½%
Engineers' and B. S. Hand..... 50&7½&5@50&10&7½&5%
Machinists' Hammers.50&5@50&10&5%
Riveting and Tinners'..... 40&2½@40&10&2½%

Heavy Hammers and Sledges—
Under 3 lb., per lb., 50¢...80&10%
3 to 5 lb., per lb., 40¢.....80&10%
Over 5 lb., per lb., 30¢..80&10&10%
Wilkinson's Smiths'...lb. 9½@10¢

Handles—
Agricultural Tool Handles
Axe, Pick, &c....60&10@60&10&5%
Hoe, Rake, &c.....45@50%
Fork, Shovel, Spade, &c.:
Long Handles.....45@50%
D Handles.....50@50&5%

Cross-Cut Saw Handles—
Atkins' 40%
Champion 50%
Disston's 50%

Mechanics' Tool Handles—
Auger, assorted...gro. $2.50@3.00
Brad Awl.....gro. $1.65@1.75
Chisel Handles, Ass'd, per gro.:
Tanged Firmer, Apple, $2.40@ $2.65; Hickory.....$2.15@2.40
Socket Firming, Apple, $1.75@ $1.95; Hickory.....$1.45@1.60
Socket Framing, Hickory, $1.60@$1.75
File, assorted.....gro. $1.30@$1.40
Hammer, Hatchet, &c. 60&10@60&10&5%
Hand Saw, Varnished, doz. 80&85¢; Not Varnished...65@75¢
Plane Handles:
Jack, doz. 30¢; Jack, Bolted.75¢
Fore, doz. 45¢; Fore, Bolted.90¢
Chapin-Stephens Co.:
Carving Tool.....40@40&10%
Chisel .....65@65&10%
File and Awl.....65@65&10%
Saw and Plane.....40@40&10%
Screw Driver.....40@40&10%
Millers Falls Adj. and Ratchet Auger Handles .....15&10%
Nicholson Simplicity File Handle.... ℔ gro. $0.85@$1.50

Hangers—
NOTE—Barn Door Hangers are generally quoted per pair, without track, and Parlor Door Hangers per double set with track, &c.

Allith Mfg. Co.:
Reliable, No. 1; Allith, No. 3; Allith Adjustable, No. 6; Reliable Parlor Door.....50%
Chicago Spring Butt Co.:
Friction 75%
Oscillating 25%
Big Twin.....25%
Chisholm & Moore Mfg. Co.:
Baggage Car Door.....50%
Elevator 30%
Railroad 50%
Cronk & Carrier Mfg. Co.:
Loose Axle.....60&10%
Roller Bearing.....70%
Griffin Mfg. Co.:
Solid Axle, No. 10, $12.00.....70%
Roller Bearing, No. 11, $15.00.70%
Roller Bearing, Ex. Hy., No. 22, $18.00.....70%
Hinged Hangers, $16.00....60&10%
Lane Bros. Co.:
Parlor, Ball Bearing, $4.00; Standard, $3.15; No. 105, $2.85; New Model, $2.80; New Champion $2.25
Barn Door, Standard.....60&5%
Hinged.....net $6.40
Covered .....60&2%
Special .....70&5%
Lawrence Bros.:
Advance and Sterling....60&10%
Cleveland and Peerless.....75%
Clipper, No. 75.....60%
Crown .....60&10%
Easy Parlor Door, Dbl. Sets, $2.50; Single Sets, $1.25.
Giant .....60&5%
Hummer .....70&5%
New York.....60&10%
McKinney Mfg. Co.:
No. 1, Special, $15.....60&10%
No. 2, Standard, $18.....60&10%
Hinges, Hangers, $16.....50%
Meyers' Stayon Hangers.....60&5%
Richards Mfg. Co.:
Hangers, Nos. 47, 48, 147, 247, 60&5%
Pioneer Wood Track No. 3..$2.00
Ball B'r'g St'l Track No. 10.50&10%
Roller B'r'g St'l Track No. 12.$2.15
Roller B'r'g St'l Track No. 13.$2.30
Roller B'r'g, Nos. 30, 41, 43, 70&10%
Hero, Adj. Track No. 19..50&10%
Adjustable Track Tandem Trolley Track No. 16.....50&10%
Seal, Steel Track No. 8....$2.25
Auto Adj. Track No. 22..50&10%
Trolley B. D. No. 17, $1.25; F. D. No. 120, $2.10; No. 121, $2.25; No. 150.....$2.35
Safety Underwriters F. D. No. 101 .....50%
Tandem No. 44..2½ and 3 60&10%
Palace, Adjustable Track No. 132 .....50&10%
Royal, Adjustable Track No. 122 .....50&10%
Ives' Wood Track No. 1.....$2.00
Trolley B. D. No. 20.....50&10%
Trolley B. D. No. 24, $1.30; No. 27, $1.40; No. 28.....$1.60
Roller Bearings, Nos. 37, 38, 39, 41, 43; 44, Sizes 1 and 2..70&10%
Anti-friction, No. 42; No. 44, sizes 2½ and 3.....60&10%
Hinged Tandem No. 48....60&5%
Folding Door B. B. Swivel No. 135 .....40%
Stowell Mfg. & Foundry Co.:
Acme Parlor Ball Bearing....30%
Ajax Hinge Door.....60%
Apex Parlor Door.....50&10&5%
Atlas 60%
Baggage Car Door.....50%
Climax Anti-Friction.....50%
Elevator 40%
Express 50%
Lundy Parlor Door.....50%
Matchless 60%
Nansen 70%
Parlor Door, 50&10%; Railroad, 50&10%
Steel, Nos. 300, 404, 500.....50%
Underwriters' Fire Door.....40%
Wild West Warehouse Door..50%
Wilbern, No. 0, net, ℔ doz..$9.00
Zenith for Wood Track.....50%
A. L. Sweet Iron Works:
Check Back, 70%; Eagle.....70%
Climax Anti-Friction.....50&10%
Hylo Hinge, New Perfection, Pilot, Pilot Hinge.....60%
Rider Wooster.....65%
Western Pattern.....70%
Taylor & Boggis F'y Co.'s Kidder's Roller Bearing.50&15&10&5%

Extra 50&10% often given.

Hangers— Garment—
Pullman Trouser, ℔ gro., 1 pair Flat Aluminoy, $9.00; 1 pair Round Nickeled, $9.00; 4 pair Round Nickeled, $27.00; 1 pair Flat Gun Metal, $12.00; 1 pair Flat Black Enameled, $7.50; 1 pair Wood Clamp, $13.00; Skirt Hangers, Folding, per gro., $21.00; Coat Hangers, Folding, per gro., $8.00; Garment Hanger Rods, Round Nickeled, per gro., $15.00; Garment Hanger Loops, Round Nickeled, per gro.....$15.00
Victor Folding.....℔ gro. $9.60
Western, W. G. Co.....75&10%

Gate—
Myers' Patent Gate Hangers, ℔ doz. net $4.50

Joist and Timber—
Lane Bros. Co.....30%

Hasps—
Griffin's Security Hasp.....60%
McKinney's Perfect Hasp, ℔ doz..50%

Hatchets—
Regular list, first quality....50%
Second quality $1.00 per doz. less than first quality.

Heaters, Carriage—
Clark, No. 5, $1.75; No. 5R, $2.00; No. 3, $2.25; No. 3D, $2.75; No. 7D, $3.00; No. 9E, $3.25; No. 1, $3.50.....15%
Clark Coal, ℔ doz. $0.75.....10%

Hinges—
Blind and Shutter Hinges—
Surface Gravity Locking Blind: (Victor; National; 1868 O. P.; Niagara; Clark's O. P.; Clark's Tip; Buffalo.)

No.	*1*	*3*	*5*
Doz. pair	$0.75	1.35	2.70

Mortise Shutter: (L. & P., O. S., Dixie, &c.)

No.	*1*	*1½*	*2*	*2½*
Doz. pair	$0.70	.65	.60	.55

Mortise Reversible Shutter (Buffalo, &c.):

No.	*1*	*1½*	*2*
Doz. pair	$0.70	.65	.60

North's Automatic Blind Fixtures, No. 2, for Wood, $9.00; No. 3, for Brick, $11.50.....10%
Charles Parker Co.....70@75%
Parker Wire Goods Co.:
Hale & Benjamin Automatic Blind Hinges 20%
Hale's Blind Awning Hinges, No. 110, for wood, $9.00; No. 111, for brick, $9.00.....20%
Reading's Gravity.....60%
Stanley's Steel Gravity Blind Hinges, No. 1647½, ℔ doz. sets, without screws, $0.95; with screws, $1.25.
Wrightsville Hardware Co.:
O. S., Lull & Porter.....75&10&5%
Acme, Lull & Porter.....75&10%
Queen City Reversible.....75&10%
Shepard's Noiseless, Nos. 60, 65, 55 .....75&10%
Niagara, Gravity Locking, Nos. 1, 3 & 5.....75&10&5%
1868, Old Pat'n, Nos. 1, 3 & 5.....75&10&5%
Tip Pat'n, Nos. 1, 3 & 5.....10&5%
Buffalo Gravity Lockin , Nos. 1, 3 & 5.....75&10&5%
Shepard's Double Locking, Nos. 20 & 25.....70%
Champion Gravity Locking, No. 75.75%
Steamboat Gravity Locking, No. 10.75%
Pioneer, Nos. 060, 45 & 5½.....75%
Empire, Nos. 101 & 103.....70%
W. H. Co.'s Mortise Gravity Locking, No. 2.....60%

Gate Hinges—
Clark's or Shepard's—Doz. sets:

No.	*1*	*2*	*3*
Hinges with L'tchs.	$2.00	2.70	5.00
Hinges only	1.40	2.05	3.80
Latches only	.70	.70	.35

New England:
With Latch.....doz. ...@$2.00
Without Latch...doz. ...@$1.60
Reversible Self-Closing:
With Latch.....doz. ...@$1.75
Without Latch...doz. ...@$1.35
Western:
With Latch.....doz. $1.75
Without Latch.....doz. $1.15
Wrightsville Hardware Co.:
Shepard's or Clark's, doz. sets.

	Nos. 1	2	3
Hinges with Latches.	$2.00	2.70	5.00
Hinges only	1.40	2.05	3.80
Latches only	.70	.70	1.35

Pivot Hinges
Bommer Bros. Pivot.....40%
Lawson Mfg. Co. Matchless.....45%

Spring Hinges—
Holdback, Cast Iron...$6.50@$7.00
Non-Holdback, Cast Iron$6.25@$6.75
J. Bardsley:
Bardsley's Non-Checking Mortise Floor Hinges.....45%
Bardsley's Patent Checking..15%
Bommer Bros.:
Bommer Ball Bearing Floor..40%
Bommer Spring Hinges.....40%
No. 999 Wrot. Steel Hold Back, ℔ gr. $9.00
Chicago Spring Butt Co.:
Chicago Spring Hinges.....25%
Triple End Spring Hinges....50%
Chicago (Ball Bearing) Floor..50%
Garden City Engine House....25%
Keene's Saloon Door.....25%
Columbian Hardware Co.:
Acme, Wrought Steel.....30%
Acme, Brass.....25%
American 30%
Columbia, ℔ gr., No. 14, $9.00; No. 18, $25.00
Columbia, Adj., No. 7, ℔ gr. $12.00
Gem, new list.....30%
Clover Leaf.....℔ gr. $12.00
Oxford, new list.....30%
Floor Spring Hinges.....65&10%
Lawson Mfg. Co. Matchless....30%
Richards Mfg. Co.:
Superior Double Acting Floor Hinges 40%
Shelby Spring Hinge Co.:
Buckeye All Steel Holdback Screen Door.....℔ gr. $9.00
Ball Bearing Floor Hinge....50%
Ohio Detachable Screen Door Hinge .....℔ gr. $9.00
Ball Bearing Door.....25%
No. 777, Sheet Steel Holdb'k, ℔ gr. pr.....$9.00
Superior Spring Hinge Co.:
Superior Floor Hinges.....33⅓%
The Stover Mfg. Co.:
Ideal, No. 16, Detachable, ℔ gr. $12.50
Ideal, No. 4.....℔ gr. $9.00
New Idea, No. 1.....℔ gr. $9.00
New Idea, Double Acting....50%
New Idea, Floor.....50%

Extra 10% often given on most of these Hinges.

Wrought Iron Hinges—
Strap and T Hinges, &c., list December 20, 1904:
Light Strap Hinges...65%
Heavy Strap Hinges..75%
Light T Hinges.....60%
Heavy T Hinges.....55%
Extra H'y T Hinges..70%
Hinge Hasps.....45%
Cor. Heavy Strap....75%
Cor. Fr. Heavy T..70&10%
Screw Hook and Strap. { *6 to 12 in..lb.* 3½¢ ; *14 to 20 in..lb.* 3¼¢ ; *22 to 36 in..lb.* 3¼¢ }

Extra 10&5% and 10&10%

Screw Hook and Eye:
¾ to 1 inch.....lb. 6½¢
⅝-inch.....lb. 7½¢
½-inch.....lb. 8½¢

Hitchers, Stall—
Covert Mfg. Co., Stall Hitchers..30&2½

Hods— Coal—
Per doz.

Inch	15	16	17	18
Galv. Open	$2.50	2.75	3.00	3.25
Jap. Open	$1.90	2.10	2.25	2.55
Galv. Funnel	$3.00	3.30	3.60	3.90
Jap. Funnel	$2.45	2.65	2.85	3.30

Masons' Etc.—
Cleveland Wire Spring Co.:
Steel Brick, No. 102.....each $0.95
Steel Mortar, No. 158.....each $1.25

Hoes— Eye—
Scovil and Oval Pattern.....60&10@60&10&10%
Grub, list Feb. 23, 1899.....70&10@75&10&10%
D. & H. Scovil.....30%

Handled—
NOTE.—Manufacturers are selling from the list of September 1, 1904, but many jobbers are still using list of August 1, 1899, or selling at net prices.
Cronk's Weeding No. 1, $2.00; No. 2, $2.25
Ft. Madison Cotton Hoe....70&10&10%
Ft. Madison Crescent Cultivator Hoe, ℔ doz.....70&10%
Ft. Madison Mattock Hoes:
Regular Weight.....℔ doz. 66⅔%
Junior Size.....℔ doz. $4.00
Ft. Madison Sprouting Hoe..℔ doz. 50%
Ft. Madison Dixie Tobacco Hoe.....75&10&10%
Kretsinger's Cut Easy.....70&10%
Warren Hoe.....45&10%
W. & C. Ivanhoe.....75&2½
B. B. 6 in., Cultivator Hoe.....$3.15
B. B., 6½ in.....$3.35
Acme Wedding.....℔ doz. net, $4.36
W. & C. L'tning Shuffle Hoe.℔doz.$4.85

Hoisting Apparatus—
See *Machines, Hoisting.*

Holders— Bit—
Angular, ℔ doz. $24.00.....45&10%

Door—
Bardsley's.....45%
Empire.....50%
Pullman.....50%
Superior.....33⅓%

File and Tool—
Nicholson File Holders and File Handles.....33⅓&40%

Fruit Jar—
Triumph Fruit Jar Holder, ℔ gross, $10.80; ℔ doz.....$1.25

Hones—Razor—
Pike Mfg. Co., Belgian, German and Swaty.....50%

Hooks—Cast Iron—
Bird Cage, Reading.....40%
Clothes Line, Reading List.....40%
Clothes Line, Stowell's.....70%
Coat and Hat, Reading.....45&20%
Coat and Hat, Stowell's.....70%
Coat and Hat, Wrightsville.....65%
Harness, Reading List.....40%
Harness, Stowell's.....60%
School House, Stowell's.....70%

Wire—
Belt.....80&10@...%
Wire C. & H. Hooks:.....75&10@75&10&10%
Columbian Hdw Co., Gem.....70&10%
Parker Wire Goods Co., King..70&10%
Western W. G. Co. Molding.....75%
Wire Goods Co.:
Acme, 60&10%; Chief, 70%; Crown, 75%; Czar, 65%; V Brace, 75%; Czar Harness, 50&10%.

Wrought Iron—
Box, 6 in., per doz., $1.00; 8 in., $1.25; 10 in., $2.50.
Cotton.....*doz. $1.85@$1.85*
Wrought Staples, Hooks, &c.—
See Wrought Goods.

Miscellaneous—
Hooks, Bench, see Stops, Bench.
Bush, Light, doz. $4.75; Medium, $5.35; Heavy, $6.25
Grass, best, all sizes, per doz.$1.60
Grass, common grades, all sizes, per doz.....$1.30
Whiffletree.....*lb. 5¾@6¢*
Hooks and Eyes:
Brass.....60&5@60&10&5%
Malleable Iron.....70@70&10%
Covert Mfg. Co. Gate and Scuttle Hooks.....40%
Ft. Madison Cut-Easy Corn Hooks, ℔ doz. $3.25 net
Bench Hooks—See Bench Stops.
Corn Hooks—See Knives, Corn.

Horse Nails—
See *Nails, Horse.*

Horseshoes—
See *Shoes, Horses.*

Hose, Rubber—
Garden Hose, ¾-inch:
Competition.....*ft. 5 @ 6 ¢*
3-ply Guaranteed..*ft. 8 @ 9 ¢*
4-ply Guaranteed..*ft. 10 @11 ¢*
Cotton Garden, ¾-in., coupled:
Low Grade.....*ft. 8 @ 9 ¢*
Fair Quality.....*ft. 10 @11 ¢*

Irons— Sad—
From 4 to 10.....*lb. 3 @3¼¢*
B. B. Sad Irons.....*lb. 3¼@3½¢*
Mrs. Potts', cents per set:

	Nos. 50	55	60	65
Jap'd Tops	65	62	75	72
Tin'd Tops	70	67	80	77

New England Pressing..*lb. 3¼@4¢*

Pinking—
Pinking Irons.....*doz. 60¢*

Irons, Soldering
See *Coppers.*

Jacks, Wagon—
Covert Mfg. Co.:
Auto Screw.....30&2½; Steel, 45%
Lockport.....50%
Lane's Steel.....30&10&2½
Richards' Tiger Steel, No. 130...50&10%
Smith & Hemenway Co.'s.....25%

Kettles—
Brass, Spun, Plain.....*20@25%*
Enameled and Cast Iron—See Ware, Hollow.

Knives—

Butcher, Kitchen, &c.—
Foster Bros.' Butcher, &c.....30%
Wilkinson Shear & Cutlery Co.....60%

Corn—
Wilkinson Wilcut Brand Knives and Hooks.....60%
Withington Acme, ℔ doz. $2.65; Dent, $2.75; Adj. Serrated, $2.20; Serrated, $2.10; Yankee No. 1, $1.50; Yankee No. 2, $1.15.

Drawing—
Standard List.....75&5@75&10%
C. E. Jennings & Co., Nos. 45, 46..60%
Jennings & Griffin, Nos. 41, 42.....60%
Swan's.....75%
Watrous.....16⅔%
L. & I. J. White.....20&5@25%

Hay and Straw—
Serrated Edge, per doz. $5.75@6.00
Iwan's Sickle Edge.....℔ doz. $0.50
Iwan's Serrated.....℔ doz. $10.00

Mincing—
Buffalo.....℔ gro. $13.00

Miscellaneous—
Farriers'.....*doz. $3.00@3.25*
Wostenholm's.....℔ doz. $3.00@3.25

Knobs—
Base, 2½-inch, Birch, or Maple, Rubber Tip.....*gro. $1.25@$1.40*
Carriage, Jap., all sizes.....*gro. 40@45¢*
Door, Mineral.....*doz. 65@70¢*
Door, Por. Jap'd.....*doz. 70@75¢*
Door, Por. Nickel..*doz. $2.05@2.15*
Bardsley's Wood Door, Shutters, &c.15%

Lacing, Leather—
See *Belting, Leather—*

Ladders, Store, &c.—
Allith Mfg. Co., Reliable.....50%
Lane's Store.....25%
Myers' Noiseless Store Ladders....50%
Richards Mfg. Co.:
Improved Noiseless, No. 112.....50%
Climax Shelf, No. 113.....50%
Trolley, No. 109.....50%

Ladles, Melting—
L. & G. Mfg. Co. (low list).....25%
P. S. & W.....50%
Reading.....50%

Lanterns—Tubular—
Regular Tubular, No. 0.....*doz. $4.25@4.50*
Lift Tubular, No. 0.....*doz. $4.75@5.00*
Hinge Tubular, No. 0.....*doz. $4.75@5.00*
Other Styles.....*40@40&5%*

Bull's Eye Police—
No. 1, 2¾-inch.....*$2.75@3.00*
No. 2, 3-inch.....*$3.00@3.25*

Lasts and Stands, Shoe—
Stowell's Atlas, Malleable Iron.....50%
Stowell's Badger, Cast Iron.....50%

Latches— Thumb—
Roggin's Latches, with screw.....*doz. 35@40¢*

Door—
Allith Mfg. Co., Automatic, No. 400, ℔ doz.....$4.00
Cronk & Carrier Mfg. Co., No. 101, ℔ doz. $2.00
Cronk & Carrier Mfg. Co., Latch, Hasp and Staples.....50%
Richards' Bull Dog, Heavy, No. 125.....50&5%
Richards' Trump, No. 127.....$1.50
Stowell's Steel.....50%

Leaders, Cattle—
Small.....*doz. 50¢; large, 60¢*
Covert Mfg. Co.:
Cotton, Hemp and Jute, 45%; Sisal, 33⅓%.

Lifters, Transom—
R. & E.....33⅓%

Lines—

Wire Clothes, Nos.	18	19	20
100 feet	$2.25	2.00	1.75
75 feet	$1.75	1.35	1.10

Anniston Waterproof Clothes, 50 ft., ℔ gro., $25.00; Gilt Edge, $23.00; Air Line, $23.00; Acme, $18.00; Alabama, $17.00; Empire, $16.00; Advance, $14.00; Eclipse, $13.50; Chicago, $11.50; Standard, $10.50; Columbia, $9.50; Allston, $13.50; Calhoun, $12.00.
Samson Cordage Works:
Solid Braided Chalk, Nos. 0 to 3..40%
Solid Braided Masons'.....30%
Silver Lake Braided Chalk, No. 0, $6.00; No. 1, $6.50; No. 2, $7.00; No. 3, $7.50.....℔ gr. 20%
Masons' Lines, Shade Cord, &c.:
White Cotton, No. 3½, $1.50; No. 4, $2.00; No. 4½, $2.50; Colors, No. 3½, $1.75; No. 4, $2.25; No. 4½, $2.75; Linen, No. 3½, $2.50; No. 4, $3.50; No. 4½, $4.50.....20%
Tent and Awning Lines: No. 5, White Cotton, $7.50; Drab Cotton, $8.50.....20%
Clothes Lines, White Cotton: 50 ft., $2.75; 60 ft., $3.25; 70 ft., $3.75; 75 ft., $4.00; 80 ft., $4.25; 90 ft., $4.75; 100 ft., $5.25.....20%

Locks— Cabinet—
Cabinet Locks...33⅓@33⅓&7½%

Door Locks, Latches, &c.—
NOTE.—Net Prices are very often made on these goods.
Reading Hardware Co.....40%
R. & E. Mfg. Co.....40%

Elevator—
Stowell's.....50%

Padlocks—
Wrought Iron....75&10&5@80&5%
Net prices are general.
R. & E. Mfg. Co. Wrought Steel and Brass.....75&10%

Sash, &c.—
Ives' Patent:
Bronze and Brass, 60%; Crescent, 40&20%; Iron, 60%; Window Ventilating, 55%; Robinson Pat. Ventilating Sash Lock, 33⅓%; Wrought Bronze and Brass, 55%; Wrought Steel, 55%.
Pullman Patent Ventilating Lock..25%
Reading.....40%

Machines—Boring—
Com. Upr't, without Augers.
$2.00@2.25
Com. Angl'r, without Augers,
$2.25@2.50
Swan's Improved.....40&10%
Jennings', Nos. 1 and 4.....35&5%
Millers' Falls.....5.75
Snell's, Rice's Pat. 2.50 2.75

Corking—
Reisinger Invincible Hand Power.... ℔ doz. $18.00

Fence—
Williams' Fence Machines....each, $5.50

Hoisting—
Moore's Anti-Friction Differential Pulley Block.....30%
Moore's Hand Hoist, with Lock Brake.....20%

Ice Cutting—
Chandler's.....12½%

Washing—
Boss Washing Machine Co.: Per doz.
Boss No. 1.....$37.0
Boss Rotary.....$54.00
Champion Rotary Banner No. 1..$51.00
Standard Champion No. 1.....$46.00
Standard Perfection.....$26.00
Cinti Square Western.....$30.00
Uneeda American, Round.....$30.00

Mallets—
Hickory.....*45&5@50%*
Lignumvitæ.....*45&5&10%*
Tinners' Hickory and Applewood.....*doz. 45&5@50%*

Mangers, Stable—
Swett Iron Works.....50%

Mashers, Vegetable—
Western, W. G. Co., Potato....60&10%

Mats, Door—
Elastic Steel (W. G. Co.), new list.50%
Keystone Wire Matting Co.:
Keystone.....50%
Ideal.....50%

Mattocks—
See *Picks and Mattocks.*

Milk Cans—See *Cans, Milk.*

Mills, Coffee, &c.—
Enterprise Mfg. Co.....20@25%
National list Jan. 1, 1902.....30%
Parker's Columbia & Victoria.50&10&60%
Parker's Box and Side.....50&10@60%
Swift, Lane Bros. Co.....30%

Motors Water—
Divine's Red Devil.....30%

Mowers, Lawn—
NOTE.—Net prices are generally quoted
Cheapest.....*all sizes, $1.85@2.00*
Cheap.....*all sizes, $2.00@2.50*
Better Grade..*all sizes, $2.50@4.50*

High Grade	12	14	16	18-in.
	$4.50	4.75	5.00	5.25

Continental.....60&5%
Great American.....70%
Great American Ball B'r'g, new list.70%
Quaker City.....70%
Pennsylvania.....60&5%
Pennsylvania, Jr., Ball Bearing....60%
Pennsylvania Golf.....50%
Pennsylvania Horse.....33⅓&5%
Pennsylvania Pony.....40&5%
Granite State:
Style A, Low Wheel....70&10&10&5%
Style B, Low Wheel.....70&10&5%
Style C, High Wheel.....70&10%
Style D, High Wheel.....70%
Philadelphia:
Styles M., S., C., K., T.....70&5%
Style A, all Steel.....60&5%
Style E, High Wheel.....70&10&5%
Drexel and Gold Coin, special list.50%

Nails—
Wire Nails and Brads, Miscellaneous.....*85&10@85&10&5%*
Cut and Wire. See Trade Report.
Hungarian, Finishing, Upholsterers' &c. See Tacks.

Horse—

Nos.	6	7	8	9	10	
Apchor	23	21	20	19	18	...40&5%
Champlain	28	26	25	24	23	.....50%
Coleman	13	12	12	11	11	.....net
New Haven	23	21	20	19	18	...40&5%

Western.....℔ lb 8½¢
Jobbers' Special Brands.....*per lb .9@10¢*

Picture—

	1½	2	2½	3	in.
Brass H'd	.55	.60	.70	..	*gro*
Por. Head	1.10	1.10	1.10	..	*gro*

Nippers—
See *Pliers and Nippers.*

Nuts—
Cold Punched: Off list.
Square, Blank or Tapped.....*4.80@4.90¢*
Hexagon, Blank or Tapped.....*5.20@5.50¢*
Square, Blank, C. & T.5.10@5.20¢
Hexagon, Blank, C. & T.....*5.80@5.90¢*
Hot Pressed:
Square, Blank.....*5.00@5.10¢*
Hexagon, Blank.....*5.40@5.50¢*
Square, Tapped.....*4.90@5.00¢*
Hexagon, Tapped.....*5.30@5.40¢*

Oakum—
Best.....*lb.*, 6½¢
U. S. Navy.....*lb.*, 6¢
Navy.....*lb.*, 5¢
Plumbers' Spun Oakum.....5¾¢
In carload lots ⅛¢ lb. off, f.o.b. New York.

Oil Tanks—See *Tanks, Oil.*

Oilers—
Brass and Copper.....50&10%
Tin or Steel.....65&10&5@70%
Zinc.....65&10@70%
Chase or Paragon:
Brass and Copper.....50&10%
Tin or Steel.....65&10%
Zinc.....65&10%
Malleable, Hammers' Imp'ed, Nos. 11, 12 and 13, 20%; Old Pattern, Nos. 1, 2, 3, 50%.
American Tube & Stamping Co.:
Spring Bottom Cans.....70@70&10%
Railroad Oilers, &c.....60@60&10%

Openers— Can— *Per doz.*
Sprague, Iron Handle.....*30@35¢*
Sprague, Wood Handle.....*35@40¢*
Sardine Scissors.....*$1.75@$3.00*
National.....50&10%
Vim Tin Shear and Can Opener, ℔ doz., 75c.; per gro., $7.50

Egg—
Nickel Plate, ℔ doz., $2.00; Silver Plate, $4.00.

Packing—
Asbestos Packing, Wick and Rope.....*17@22¢*

Rubber—
(*Fair quality goods.*)
Sheet, C. I.....*11@12¢*
Sheet, C. O. S.....*11@12¢*
Sheet, C. B. S.....*12@13¢*
Sheet, Pure Gum.....*40@45¢*
Sheet, Red.....*40@50¢*
Jenkins' '96, ℔ lb 80¢.....25@25&5%

Miscellaneous—
American Packing...*lb. 7@10 ¢*
Cotton Packing.....*lb. 16@25 ¢*
Italian Packing.....*lb. 9@12½¢*
Jute.....*lb. 4@4½¢*
Russia Packing.....*lb. 8@11 ¢*

Pails, Creamery—
R. M. Co., with gauges, ℔ doz., No. 1, $6.25; No. 2, $6.50.

Pails, Water, Well, &c.—
See *Buckets.*

Pans— Dripping—
Standard List.....*65&10%*

Fry—
Common Lipped:

Nos.	1	2	3	4	5
Per doz.	$0.75	0.80	0.90	1.10	1.30

Refrigerator, Galva.—

Inch	12	14	16	18
Per doz.	$1.75	2.25	2.80	3.15

Roasting and Baking—
Regal, R. M. Co., ℔ doz., Nos. 5, $1.50; 10, $5.25; 20, $5.75; 30, $6.25.
Savory, ℔ doz., net, Nos. 200, $9.00; 400, $15.00.
Simplex, ℔ gro.:

No.	40	50	60	140	150	160
	$30.00	35.00	42.00	34.00	39.00	46.00

Paper—Building Paper

Asbestos:	*lb.*
Roll Board or Building Felt, 6 to 30 lb., per 100 sq. ft.	*6¢*
Roll Board or Building Felt, 3-32 and ⅛ in., 45 to 60 lbs., per 100 sq. ft.	*8¢*
Mill Board, Sheet, 40 x 40 in., 1-32 to ⅛ in.	*7¢*

Rosin Sized Sheathing: 500 sq. ft. per roll
Light weight, 25 lbs. to roll.....*40@50¢*
Medium weight, 30 lbs. to roll.....*50@55¢*
Heavy weight, 40 lbs. to roll.....*65@70¢*
Black Water Proof Sheathing, 500 sq. ft., 1 ply, 65¢; 2 ply, 85¢; 3 ply, $1.10; 4 ply, $1.25.
Deafening Felt, 9, 6 and 4½ sq. ft. to lb. ton.....*$50.00*
Red Rope Roofing, 250 sq. ft. per roll.....*$1.75*

Tarred Paper—
1 ply (roll 400 sq. ft.), ton.....*$31.00@$35.00*
2 ply, roll 108 sq. ft.....*57¢*
3 ply, roll 108 sq. ft.....*80¢*
Slater's Felt (roll 500 sq. ft.).76¢

Sand and Emery—
Flint Paper and Cloth.50&10@—%
Garnet Paper and Cloth.....*25%*
Emery Paper and Cl'h..50&10@60%

Parers— Apple—
Advance.....℔ doz. $4.00
Baldwin.....℔ doz. $4.00
Bonanza Improved.....each $6.50
Daisy.....℔ doz. $4.00
Dandy.....each $7.50
Eureka Improved.....each $20.00
Family Bay State.....℔ doz. $15.00
Improved Bay State.....℔ doz. $36.00
Little Star.....℔ doz. $5.00
New Lightning.....℔ doz. $7.00
Reading 72.....℔ doz. $3.25

Reading 78.....₱ doz. $6.25
Rocking Table.....₱ doz. $6.20
Turn Table '98.....₱ doz. $6.00
White Mountain.....₱ doz. $5.00

Potato—

Saratoga.....₱ doz. $7.00
White Mountain.....₱ doz. $6.00

Picks and Mattocks—

List, Feb. 23, 1899.....75@75&5%
Cronk's Handled Garden Mattock, ₱ doz., $6.40.....33⅓%

Pinking Irons—

See *Irons, Pinking.*

Pins, Escutcheon—

Brass.....50&10@60%
Iron, list Nov. 11, '85..60@60&10%

Pipe, Cast Iron Soil—

Carload lots.
*Standard, 2-6 in.*50&10@50&10&5%
Extra Heavy, 2-6 in.....65&10%
Fittings.....70&10@70&10&5%

Pipe, Merchant—

Consumers, Carloads.

	Steel. Blk.	Galv.	Iron. Blk.	Galv.
⅛ & ¼ *in.*	71%	55%	68%	52 %
⅜ *in.*	73%	59%	70%	56 %
½ *in.*	75%	63%	72%	60 %
¾ *to 6 in.*	79%	69%	76½%	66⅔%
7 to 12 in.	74%	59%	71½%	56 %

Pipe, Vitrified Sewer—

Carload lots.
Standard Pipe and Fittings, 3 to 24 in., f.o.b. factory:
First-class.....85@86%
Second-class.....90%
NOTE.—Market irregular.

Pipe, Stove—

Edwards' Nested:	C. L.	L. C. L.
5 in., per 100 joints	$7.00	$8.00
6 in., per 100 joints	7.50	8.50
7 in., per 100 joints	8.50	9.50

Planes and Plane Irons—

Wood Planes—

Bench, first qual.....35@35&10%
Bench, second qual...45@45&10%
Molding.....30@30&10%
Bailey's (Stanley R. & L. Co.).35&2½%
Chapin-Stephens Co.:
Bench, First Quality.....35%
Bench, Second Quality.....45%
Molding and Miscellaneous.....30%
Toy and German.....35%
Union.....60%

Iron Planes—

Bailey's (Stanley R. & L. Co.)....35%
Chapin's Iron Planes.....50&10%
Miscellaneous Planes (Stanley R. & L. Co.).....30&5%
Union.....60%

Plane Irons—

Wood Bench Plane Ir 's.....25@25&10%
Buck Bros.....30%
Chapin-Stephens Co.....25%
Stanley R. & L. Co.....35%
Union.....50%
L. & I. J. White.....20&5@25%

Planters, Corn, Hand—

Kohler's Eclipse.....₱ doz. $8.50

Plates—

Felloe.....*lb.*4@4¼¢
Self-Sealing Pie Plates (R. M. Co.), ₱ doz. $2.00.....50%

Pliers and Nippers -

Button Pliers....75&10@75, 10, 5%
Gas Burner, per doz., 5 in., $1.25 @ $1.30; 6 in., $1.45 @ $1.50.

Gas Pipe..	7	8	10	12-in.
	$2.00	$2.25	$2.75	$3.50

Acme Nippers.....50&5%
Cronk & Carrier Mfg. Co.:
American Button.....75&10%
Cronk's.....60
Stub's Pattern.....50
Combination and others.....33⅓%
Heller's Farriers' Nippers, Pincers and Tools.....40&10@40&10&10%
The Nettleton Mfg. Co. Reversible Cutting Nippers.....40%
P., S. & W. Tinners' Cutting Nippers.....40%
Wm. Scollhorn Co.:
Bernard, 33⅓%; Elm City, 33⅓%; Paragon, 50%; Lodi, 50%.
Swedish Side, End and Diagonal Cutting Pliers.....50%
Utica Drop Forge & Tool Co.:
Pliers and Nippers, all kinds.....40%

Plumbs and Levels—

Chapin-Stephens Co.:
Plumbs and Levels.....30@30&10&5%
Chapin's Imp. Brass Cor..40@40&10%
Pocket Levels.....30@30&10&5%
Extension Sights.....30@30&10&5%
Machinists' Levels.....40@40&10%
Disston's Plumbs and Levels.....67½%
Disston's Pocket Levels.....67½%
C. E. Jennings & Co.'s Iron.....33⅓%
C. E. Jennings & Co.'s Iron, Adjustable.....40&7½%
Stanley R. & L. Co.....40%
Stanley's Duplex.....33⅓%
Woods' Extension.....33⅓%

Poachers, Egg—

Buffalo Steam Egg Poachers, ₱ doz., No. 1, $6.00; No. 2, $9.00; No. 3, $9.00; No. 4, $12.00.....50%

Points, Glaziers'—

Bulk and 1-lb. papers,.....*lb.*10¢
½-lb. papers.....*lb.*9@10½¢
¼-lb. papers.....*lb.*9¾@11¢

Pokes, Animal—

Ft. Madison Hawkeye.....₱ doz. $3.25
Ft. Madison Western.....₱ doz. $4.00

Police Goods—

Manufacturers' Lists...25@25&5%
Tower's.....25%

Polish—Metal, Etc—

Glasbrite, No. 2, 5 lb can (powder), each, $1.25; ₱ doz., $12.00; No. 2, 10 lb can (cake), each, $2.50; ₱ doz., $24.00.
Prestoline Liquid, No. 1 (½ pt.), ₱ doz., $3.00; No. 2 (1 qu.), $5.72....40%
Prestoline Paste.....40%
George William Hoffman:
U. S. Metal Polish Paste, 3 oz. boxes, ₱ doz. 50¢; ₱ gro. $4.50; ½ lb boxes, ₱ doz. $1.25; 1 lb boxes ₱ doz. $2.25.
U. S. Liquid, 8 oz. cans, ₱ doz., $1.25; ₱ gro., $12.00.
Barkeepers' Friend Metal Polish, ₱ doz., $1.75; ₱ gro., $18.00.
Wynn's White Silk, ½ pt. cans, ₱ doz.....$2.00

Stove—

Black Eagle Benzine Paste, 5 lb cans, ₱ lb 10¢
Black Eagle, Liquid, ½ pt. cans, ₱ doz. 75¢
Black Jack Paste, ¾ lb cans, ₱ gr. $6.00
Black Kid Paste, 5 lb can....each, $6.65
Ladd's Black Beauty Liquid, per 100 tins.....$6.75
Joseph Dixon's, ₱ gr. $5.75.....10%
Dixon's Plumbago.....₱ lb 8¢
Fireside.....₱ gr. $2.50
Gem, ₱ gr. $1.50.....10%
Japanese.....₱ gr. $3.50
Jet Black.....₱ gr. $3.50
Peerless Iron Enamel, 10 oz. cans, ₱ doz. $1.50
Wynn's:
Black Silk, 5 lb pail.....each 70¢
Black Silk, ½ lb box.....₱ doz. $1.00
Black Silk, 5 oz. box.....₱ doz. $0.75
Black Silk, ½ pt. liq.....₱ doz. $1.00

Poppers, Corn—

1 qt., Square.....*gro.* $8.00
1 qt., Round.....*gro.* $9.00
1½ qt., Square.....*gro.*$10.00
2 qt., Square.....*gro.*$12.00

Post Hole and Tree Augers and Diggers—

See also *Diggers, Post Hole, &c.*

Posts, Steel—

Steel Fence Posts, each, 5 ft., 42¢; 6 ft., 46¢; 6½ ft., 48¢.
Steel Hitching Posts.....each $1.30

Potato Parers—

See *Parers, Potato.*

Pots, Glue—

Enameled.....40%
Tinned.....35%

Powder—

In Canisters:
Duck, 1 lb.....*each* 45¢
Fine Sporting, 1 lb....*each* 75¢
Rifle, ½-lb.....*each* 15¢
Rifle, 1-lb.....*each* 25¢
In Kegs:
12½-lb. kegs.....$3.50
25-lb. kegs.....$4.50
King's Semi-Smokeless:
Keg (25 lb bulk).....$6.50
Half Keg (12½ lb bulk).....$3.50
Quarter Keg (6¼ lb bulk).....$1.90
Case 24 (1 lb cans bulk).....$8.50
Half case (1 lb cans bulk).....$4.50

King's Smokeless:	Shot Gun.	Rifle.
Keg (25 lb bulk)	$12.00	$15.00
Half Keg (12½ lb bulk)	6.25	7.75
Quarter Keg (6¼ lb bulk)	3.25	4.00
Case 24 (1 lb cans bulk)	14.00	17.00
Half case 12 (1 lb c. bx)	7.25	8.75

Robin Hood Sm'less Shot Gun..50&20%

Presses—

Fruit and Jelly—

Enterprise Mfg. Co.....20@25%

Seal Presses—

Morrill's No. 1, ₱ doz., $20.00.....50%

Pruning Hooks and Shears

See *Shears.*

Pullers, Nail—

Cyclops.....50%
Miller's Falls, No. 3, ₱ doz., $12.00.....33⅓&10%
Morrill's No. 1, Nail Puller, ₱ doz. $20.00.....50%
Pearson No. 1, Cyclone Spike Puller, each $30.00.....50%
Scranton, Case Lots:
No. 2B (large).....$5.50
No. 3B (small).....$5.00
Smith & Hemenway Co.:
Diamond B, case lots, ₱ doz., Large, $9.00; Small, $7.50.
Giant No. 1, ₱ doz., $18; No. 1½, $16.50; No. 3, $15.....33⅓%
Staple Pullers, Utica and Davison.....60%
Parrot Tack and Stub Puller, ₱ doz., 75c.; ₱ gro., $8.00

Pulleys, Single Wheel—

Inch	1½	1¾	2	3
Awning or Tackle, doz.	$0.30	.45	.60	1.05

Hay Fork, Swivel or Solid Eye. doz., ½ in., $1.25; 5 in., $1.55

Inch	2	2¼	2½
Hot House, doz.	$0.65	.85	1.20
Inch	1¼	1½	1¾ 2
Screw, doz.	$0.16	.19	.23 .30
Inch	1¾	2	2¼ 2½
Side, doz.	$0.25	.40	.55 .60
Inch	1½	1¾	2 2½

Stowell's:
Ceiling or End, Anti-Friction..60&10%
Dumb Waiter, Anti-Friction..60&10%
Electric Light.....60%
Side, Anti-Friction.....60&10%

Sash Pulleys—

Common Frame; Square or Round End, per doz, 1¾ and 2 in.....*10@19¢*
Auger Mortise, no Face Plate, per doz., 1¾ and 2 in....*17@19¢*
Acme.....1¾ in., 16¢; 2 in., 19¢
Fox-All-Steel, Nos. 3 and 7, 2 in.... ₱ doz. 50%
Grand Rapids All Steel Noiseless..50%
Ideal.....70&5%
Niagara.....1¾ in. 16¢; 2 in., 19¢
No. 26, Troy..1¾ in., 14½¢; 2 in., 16½¢
Star.....1¾ in., 16¢; 2 in., 19¢
Tackle Blocks—See Blocks.

Pumps—

Cistern.....60@60&10%
Pitcher Spout.....80@80&10%
Wood Pumps, Tubing, &c..45@50%
Barnes Dbl. Acting (low list).....50%
Barnes' Pitcher Spout.....75&10&5%
Contractors' Rubber Diaphragm No. 2, B. & L. Block Co.....$16.00
Daisy Spray Pump.....₱ doz. $6.75
Flint & Walling's, Fast Mail Hand (low list).....55%
Flint & Walling's, Fast Mail (low list).....55&5%
Flint & Walling's Tight Top Pitcher.80%
National Specialty Mfg. Co., Measuring, $6.00.....30%
Mechanical Sprayer.....$6.00
Myers' Pumps (low list).....50%
Myers' Power Pumps.....50%
Myers' Spray Pumps.....50&10%

Pump Leathers—

Plunger and Lower Valve—Per gro.:

Inch...	2	2¼	2½	2¾
	$2.20	2.50	2.75	3.00
Inch...	3	3¼	3½	3¾ 4
	$3.30	3.60	3.85	4.10 4.40

Plunger Cup Leathers—Per 100:

Inch...	2½	3	3½	4
	$2.75	3.85	5.00	6.00

Punches—

Saddlers' or Drive, good.....*doz.* 50@75¢
Spring, single tube, good quality.....$1.75@2.00
Revolving (4 tubes).....*doz.* $3.50@3.75
Bemis & Call Co.'s Cast St'l Drive.50%
Bemis & Call Co.'s Check.....55%
Morrill's Nos. 1AA, 1A, 1B, 1C, $15.00.....50%
Hercules, 1 die, each $5.00.....50%
Niagara Hollow Punches.....40%
Niagara Solid Punches.....55&10%
Wm. Scholthorn Co.:
Belt and Ticket, Bernard, 33⅓%; Paragon, 50%; Lodi.....50%
Steel Screw, B. & K. Mfg. Co.....50%
Tinners' Hollow, P., S. & W. Co..40%
Tinners' Solid, P., S. & W. Co., ₱ doz., $1.44.....60%

Rail—Barn Door, &c.—

Sliding Door, Painted Iron.....2¼@2¾¢
Sliding Door, Wrought Brass, 1½ in., lb......36¢.....30%
Allith Mfg. Co.: Reliable Hanger Track.....50%
Cronk's:
Double Braced Steel Rail..₱ ft. 2¾¢
O. N. T. Rail.....2¾¢
Griffin's:
xxx, ₱ 100 ft., 1 x 3-16 in., $3.00; 1¼ x 3-16 in., 3.50.
Hinged Hanger, ₱ 100 ft., 1 x 3-16 in., $3.10; 1¼ x 3-16 in., $3.60.
Lane's:
Hinged Track, ₱ 100 ft., 1 in., $3.60; 1¼ in., $4.10.
O. N. T., ₱ 100 ft., 1 in., $2.75; 1¼ in., $3.50; 1½ in., $4.00.
Standard, 1¼ in.....₱ 100 ft. $4.00
Lawrence Bros.:
₱ 100 ft. No. 201, $4.00; No. 202, $4.00
New York, 1 x 3-16 in., ₱ 100 ft., $2.75
McKinney's:
Hinged Hanger Rail, ₱ ft., 11¢..50%
None Better.....₱ ft. 3¾¢
Standard.....₱ ft. 4 ¢
Myers' Stayon Track.....60&10%
Richards' Mfg. Co.:
Common, 1 x 3-6 in., $3.00; 1¼ x 3-16, $3.25; 1¼ x 3-16, $3.50.
Special Hinged Hanger Rail...60&10%
Lag Screw Rail, No. 65.....50%
Gauge Trolley Track, ₱ ft., No. 31, 9¢; No. 32, 14¢; No. 33, 20¢.
No. 50.....60&10%
Nos. 61, $3.00; 62, $3.25; 63, $3.50; 64, $4.00; 45, $3.25; 46, $3.50; 49, No. 1, $3.25; 49, No. 2, $3.50.
Stowell's:
Cast Rail.....₱ ft. 2¼¢
Steel Rail, Plain.....25%
Wrought Bracket, 1 3-16 in....₱ ft. 3¢
Wrought Bracket, 1⅛ x 5-16..₱ ft. 7¢
Swett's Hylo, ₱ ft. 11¢.....60%
P. L. B. Steel Rail.....₱ 100 ft. $3.00
No. 0, 1 x 3-16.....₱ 100 ft. $3.00

Rakes—

NOTE.—Many goods are sold at net prices.
Fort Madison Red Head Lawn....$3.25
Fort Madison Blue Head Lawn....$2.70
Jackson Lawn, 29 and 30 teeth, ₱ doz., net.....$4.25
Cronk's:
New Champion Garden, ₱ doz., 12 teeth, $15.00; 14, $16.50; 16, $18.00..75%
Victor Garden, ₱ doz., 12 teeth, $15.00; 14, $16.50; 16, $18.00.....60%
Queen City Lawn, ₱ doz., 20 teeth, $3.45; 24, $3.60.....net.
Anticlog Lawn, ₱ doz.....$4.00
Malleable Garden.....70&10%
Kohler's:
Lawn Queen, 20-tooth.....₱ doz. $3.45
Lawn Queen, 24-tooth.....₱ doz. $3.60
Paragon, 20-tooth.....₱ doz. $2.75
Paragon, 24-tooth.....₱ doz. $3.00
Steel Garden, 14-tooth....₱ doz. $2.40
Malleable Garden, 14-tooth, ₱ doz. $1.75@2.00

Rasps, Horse—

Disston's.....75%
Heller Bros.'.....70&5@70&10&5%
McCaffrey's American St'd..60&10&5%
New Nicholson.....70&10@75%
See also Files.

Razors—

Liana Bo-ras-ic.....60%
Fox Razors, ₱ doz., No. 42, $20.00; No. 44, $20.00; No. 82, Platina, $28.00. } Discount 25%
Red Devil.....50%
Silberstein:
Carbo Magnetic, $21.00; Griffon, No. 65, $13.50; Griffon, No. 60, $12.00; all other Razors, 40%.

Safety Razors—

Kampfe Bros.:
Star Safety, 25%; Star Interchangeable, 25%; Star Safety Corn, 25%.
Silberstein.....40%

Reels, Fishing—

Hendryx:
M 6, Q 6, A 6, B 6, M 9¼, M 16, Q 16, A 16, B 16, 4008, Rubber, Populo, Nickeled Populo.....20%
Aluminum, German Silv., Bronze.25%
1240 N, 124 N.....20%
3004 N, 06 N, 6 KM, G 9.....25%
4 N, 6 PN, 24 N, 26 PN.....20%
2904 P, 33¼%; 2904 PN, 33⅓%; 0924 N, 33⅓%; 02004 N, 33⅓%; 002904 PN, 33⅓%; 902 N, 33⅓%.
986 PN, 2904 N, 974 PN.....25%
5009 PN, 5009 N.....20%
Competitor, 102 P, 102 PN, 202 P, 202 PN, 102 PR, 202 PR.....20%
304 P, 304 PN, 00304 P, 00304 PN.33⅓%

Registers—*List July 1, 1903.*

Japanned, Electroplated and Bronzed.....70%
White Porcelain Enamel....60%
Solid Brass or Bronze Metal, 40&10%

Revolvers—

Single Action.....95¢@$1.00
Double Action, except 44 cal.$1.85
Double Action, 44 caliber....$2.00
Automatic.....$3.25
Hammerless.....$3.75

Riddles, Hardware Grade

16 in.....*per doz.*$2.50@$2.75
17 in.....*per doz.*$2.75@$3.00
18 in.....*per doz.*$3.00@$3.25

Rings and Ringers—

Bull Rings—

	2	2½	3 *inch.*
Steel	$0.70	0.75	0.80 *doz.*
Copper	$1.00	1.15	1.40 *doz.*

Rea's Improved Self-Piercing, ₱ doz., Copper, 2 in., $1.25; 2½ in., $1.50; 3 in., $1.75.

Hog Rings and Ringers—

Hill's Rings, gro. boxes.$4.00@$4.50
Hill's Ringers, Gray Iron.....*doz.* 50@55¢
Hill's Ringers, Malleable Iron..*doz.* 70@75¢
Blair's Rings...*per gro.*$4.75@5.25
Blair's Ringers.per doz. $0.60@ .65
Brown's Rings..*per gro.*$5.00@5.50
Brown's Ringers.per doz.$0.60@ .65

Rivets and Burrs—

Copper.....40&2½%
Iron or Steel.....75@75&5%

Bifurcated and Tubular—

Assorted in Boxes.
Bifurcated, per doz. boxes, pasteboard boxes, 23@25¢; Tin boxes, 29@32¢.
Tubular, per doz. boxes, 50 count, 29@32¢; 100 count, 51@58¢.

Rollers—

Acme, Stowell's Anti-Friction.....50%
Cronk's Stay No. 65, $0.90; No. 50.....$1.00
Cronk's Brinkerhoff No. 55, $0.60; No. 56.....$0.84
Lane's Stay.....40%
Richards' Stay:
Handy Adj. and Reversible No. 53.75¢
O. K. Adj. and Reversible No. 58.50¢
Lag Screw, Nos. 55 and 57.....50%
Underwriters', Nos. 59, 60.....50%
Favorite, No. 54.....60%
Stowell's Barn Door Stay..₱ doz. $1.00
Swett's Anti-Friction.....50%
Screw and Spike Stay.....₱ doz. 65¢
Hinge Adjustable Stay.....₱ doz. 90¢

Rope—

Manila, 7-16 in. diam. and larger:
Pure.....*lb.*, 12¼¢
Sisal, 7-16 in. diam. and larger:
Pure.....*lb.*, 9¢
Sisal, 7-16 in. diam. and larger; No. 2 quality.....*lb.*, 7¾@8¢
Sisal, Hay, Hide and Bale Ropes, Medium and Coarse:
Mixed.....*lb.*, 7¾@8¢
Pure.....*lb.*, 9¢
Sisal, Tarred, Medium Lath Yarn, Coarse and Untarred:
Mixed.....*lb.*, 7¾@8¢
Pure.....*lb.*, 9¢
Cotton Rope:
*Best, ¼-in. and larger.*16½@18¢
Medium, ¼-in. and larger. 15½@16½¢
*Common, ¼-in. and larger..*10¢
In coils, ½¢ advance.
Jute Rope:
Thread, No. 1, ¼-in. & up, lb., 8@8½¢
Thread, No. 2, ¼-in. & up, lb.. 7½@7¾¢
Old Colony Manila Transmission Rope.....₱ lb 17½¢

Wire Rope—

Galvanized.....37½&42½%
Plain.....45&42½%

Ropes, Hammock—

Covert Mfg. Co.:
Jute, 45%; Sisal.....33⅓%

Rules

Boxwood .....60@60&10%
Ivory .....35&10@35&10&5%
Chapin-Stephens Co.:
Boxwood 60%
Flexifold .....27½&10&10%
Ivory .....35@35&10&10%
Miscellaneous .....50@50&10&10%
Stephens' Combination.....55@55&10%
Stationers' .....10@10&10%
Keuffel & Esser Co.:
Folding, Wood.....35&10%
Folding, Steel.....33⅓&10%
Lufkin's Steel.....50&10%
Lufkin's Lumber.....60%
Stanley R. & L. Co.:
Boxwood 60%
Ivory 45%
Miscellaneous 60%
Zig Zag.....40%
Zig Zag, Pin Joint.....43⅓%
Upson Nut Co.:
Boxwood .....60@60&10%
Ivory .....35&10@35&10&10%

Sash Balances—
See *Balance, Sash.*

Sash Locks—
See *Locks, Sash.*

Sash Weights—
See *Weights, Sash.*

Sausage Stuffers or Fillers
See *Stuffers or Fillers, Sausage.*

Saw Frames—
See *Frames, Saw.*

Saw Sets—See *Sets, Saw.*

Saw Tools—See *Tools, Saw.*

Saws—
Atkins':
Circular 50%
Band .....50&10@60%
Cross Cuts.....35&5%
Mulay, Mill and Drag.....50%
One-Man Saw, 40%; Wood Saws, 40%; Hand, Compass, &c., 40%.
Chapin-Stephens Co.:
Turning Saws and Frames..30@30&10%
Diamond Saw & Stamping Works:
Sterling Kitchen Saws....30&10&10%
Disston's:
Circular, Solid and Ins'ted Tooth.50%
Band, 2 to 14 in. wide.....60%
Band, ¼ to 1¾.....60%
Crosscuts 45%
Narrow Crosscuts.....50%
Mulay, Mill and Drag.....50%
Framed Woodsaws.....25%
Woodsaw Blades.....25%
Woodsaw Rods.....25%
Hand Saws, Nos. 12, 99, 9, 16, d100, 108, 120, 76, 77, 8.....25%
Hand Saws, Nos. 7, 107, 107½, 3, 1, 0, 00, Combination.....30%
Compass, Key Hole, &c.....25%
Butcher Saws and Blades.....30%
C. E. Jennings & Co.'s:
Back Saws.....25%
Butcher Saws.....30%
Compass and Key Hole Saws..35&5%
Framed Wood Saws.....30%
Hand Saws.....20&2½%
Wood Saw Blades.....35%
Millers Falls:
Butcher Saws.....15&10%
Star Saw Blades.....15&10%
Massachusetts Saw Works:
Victor Kitchen Saws.....40&10&50%
Butcher Saws Blades.....35@40%
Peace & Richardson's Hand Saws...30%
Simonds':
Circular Saws.....50%
Crescent Ground Cross Cut Saws..35%
One-Man Cross Cuts.....40&10%
Gang Mill, Mulay and Drag Saws.50%
Band Saws.....50%
Back Saws.....25@25&7½%
Butcher Saws.....35@35&7½%
Hand Saws.....25@25&7½%
Hand Saws, Bay State Brand.....40%
Compass, Key Hole, &c..25@25&7½%
Wood Saws.....40&7½%
Wheeler, Madden & Clemson Mfg. Co.'s Cross Cut Saws.....50%

Hack Saw Blades and Frames—
Atkins' Hack Saw Blades A A A..25%
Disston's:
Concave Blades.....25%
Keystone Blades.....35%
Hack Saw Frames.....30%
Fitchburg File Works, The Best...35%
C. E. Jennings & Co.'s'
Hack Saw Frames, Nos. 175, 180.... 40&7½%
Hack Saws, Nos. 175, 180, complete, 40&7½%
Goodell's Hack Saw Blades.....40%
Griffin's Hack Saw Frames..35&5&10%
Griffin's Hack Saw Blades....35&5&10%
Star Hack Saws and Blades.....15&10%
Sterling Hack Saw Blades....30&10&5%
Sterling Hack Saw Frames...30&10&10%
Sterling Power Hack Saw Machines, each, No. 1, $25.00; No. 2, $30.00..10%
Victor Hack Saw Blades.....25%
Victor Hack Saw Frames.....40%

Scroll—
Barnes, No. 7, $15.....25%
Barnes' Scroll Saw Blades.....40%
Barnes' Velocipede Power Scroll Saw, without boring attachment, $18; with boring attachment, $20.....25%
Lester, complete, $10.00.....15&10%
Rogers, complete, $4.00.....15&10%

Scales—
Family, Turnbull's....50@50&10%
Counter:
Hatch, Platform, ½ oz. to 4 lbs. .....doz. $5.50
Two Platforms, ½ oz. to 8 lbs. .....doz. $16.00
Union Platform, Plain.$1.70@1.90
Union Platform, Stpd.$1.85@2.15
Chatillon's:
Eureka 25%
Favorite 40%
Crocers' Trip Scales.....50%
Chicago Scale Co.:
The "Little Detective"....25 to 50%
Union or Family No. 2.....60%
Portable Platform (reduced list)..50%
Wagon or Stock (reduced list) .25@35%
"The Standard" Portables.....50%
"The Standard" R. R. and Wagon .....50&10%

Scrapers—
Box, 1 Handle.....doz. $2.00@2.25
Box, 2 Handle.....doz. $2.50@2.60
Ship....Light, $2.00; Heavy, $4.50
Adjustable Box Scraper (S. R. & L. Co.), $6.00.....45%
Chapin-Stephens Co., Box, 30@30&10&10%

Screens, Window and Frames—
Maine Screen Frames.....40&10&5%
See also *Doors.*

Screws—Bench and Hand
Bench, Iron, doz., 1 in., $2.50@2.75; 1¼, $3.00@3.25; 1¼ .$3.50@3.75
Bench Wood .....25@25&5%
Hand, Wood .....25@25&5%
R. Bliss Mfg. Co., Hand....30@30&10%
Chapin-Stephens Co., Hand.....25%

Coach, Lag and Hand Rail—
Lag, Cone Point, list Oct. 1, '99 .....75&15%
Coach, Gimlet Point, list Oct. 1, '99 .....75&10%
Hand Rail, list Jan. 1, '81.... 70&10@75%

Jack Screws—
Standard List.....75%
Millers Falls.....50&10&10%
Millers Falls, Roller.....50&10%
P., S. & W.....50%
Swett Iron Works.....75@80%

Machine—
List Jan. 1, '98:
Flat or Round Head, Iron.... 50@50&10%
Flat or Round Head, Brass.... 50@50&10%

Set and Cap—
Set (Iron).....80&7½%
Set (Steel), net advance over Iron 25%
Sq. Hd. Cap.....75&10&7½%
Hex. Hd. Cap.....75&10&7½%
Rd. Hd. Cap.....60&10%
Fillister Hd. Cap.....60&10&10%

Wood—
List July 23, 1903.
Flat Head, Iron.....87½&10@..%
Round Head, Iron...85 &10@..%
Flat Head, Brass.....82½&10%
Round Head, Brass..80 &10@..%
Flat Head, Bronze...77½&10@..%
Round Head, Bronze.75 &10@..%
Drive Screws.....87½&10%

Scroll Saws—
See *Saws, Scroll.*

Scythes—
Per doz.
Grass, No. 1, Plain....$6.25@6.75
Clipper, Bronzed Webb..$6.50@7.00
No. 3 Clipper, Pol'd Webb.. $6.75@7.25
No. 6 Clipper and Solid Steel, $7.00@7.50
Bush, Weed and Bramble, No. 2. $6.50@7.00
Grain, No. 1.....$8.25@8.75
Bronzed Webb, No. 1..$8.50@9.00
Nos. 3 and 4 Clipper, Grain.. $8.75@9.25
Solid Steel, No. 6.....$9.25@9.75

Seeders, Raisin—
Enterprise .....25@30%

Sets—Awl and Tool—
Fray's Adj. Tool Handles, Nos. 1, $12; 2, $18; 3, $12; 4, $9; 5, $7.....50%
C. E. Jennings & Co.'s Model Tool Holders 30%
Millers Falls Adj. Tool Handles, No. 1, $12; No. 4, $12; No. 5, $18....15&10%

Garden Tool Sets—
Ft. Madison Three Plows, Hoe, Rake and Shovel.....℔ doz sets $9.00

Sets, Nail—
Octagon .....gro. $3.50@3.75
Buck Bros.....27½%
Cannon's Diamond Point, ℔ gro. $12.40%
Mayhew's .....℔ gro. $9.00
Snell's Corrugated, Cup Pt....℔ gro. $7.20
Snell's Knurled, Cup Pt....℔ gro. $7.20
Victor Knurled Cup Pt....℔ gro. $7.50

Rivet—
Regular list.....75@75&10%

Saw—
Atkin's:
Criterion 40%
Adjustable 40%
Bemis & Call Co.'s:
Cross Cut.....30%
Plate 20%
Disston's Star, Monarch and Triumph 30%
Morrill's No. 1, $15.00..... 50%
Nos. 3 and 4, Cross Cut, $20.00...50%
No. 5, Mill, $30.00..... 50%
Nos. 10, 11, 95, $15.00.....50%
No. 1 Old Style, $10.00.....50%
Special, $16.25.....50%
Giant Royal Cross Cut....℔ doz. $8.00
Royal, Hand.....℔ doz. $4.50
Taintor Positive.....℔ doz. $6.75

Shaving—
Fox Shaving Sets, No. 30 ..... ℔ doz., net, $24.00
Smith & Hemenway Co.'s.....60%

Sharpeners, Knife—
Chicago Wheel & Mfg. Co.....70%
Pike Mfg. Co.:
Fast Cut Pocket Knife Hones, ℔ doz.....$1.50
Mounted Kitchen Sand Stone, ℔ doz.....$1.50
Natural Grit Carring Knife Hones, ℔ doz.....$3.00
Quick Cut Emery Carving Knife Hones, ℔ doz.....$1.50
Quick Edge Pocket Knife Hones, ℔ doz.....$2.50

Skate—
Smith & Hemenway Co., Eureka..20%

Shaves, Spoke—
Iron .....doz.$1.10@1.25
Wood .....doz.$1.75@2.25

Bailey's (Stanley R. & L. Co.).....45%
Razor Edge (Stanley R. & L. Co.), Iron, 50%; Wood.....55%
Chapin-Stephens Co.....30@30&10&10%
Goodell's, ℔ doz. $9.00.....15&10%
Wood's F1 and F2.....50%

Shears—
Cast Iron..	7	8	9 in.	
Best	*$16.00*	*18.00*	*20.00*	*gro.*
Good	*$13.00*	*15.00*	*17.00*	*gro.*
Cheap	*$5.00*	*6.00*	*7.00*	*gro.*

Straight Trimmers, &c.:
Best quality Jap....70@70&10%
Best quality, Nickel..60@60&10%
Fair quality, Jap....80@80&5%
Fair quality, Nickel..75@7"&10%
Tailors' Shears.....40@40&10%
Acme Cast Shears.....40@40&5
Heinisch's Tailor's Shears.....10%
Wilkinson's Sheep, 1900 list, 30&10&5%; Grass, 50&10%; Horse or Mule, 50&10%

Tinners' Snips—
Steel Blades.....20&5@20&10%
Steel Laid Blades.....40&10@50%
Forged Handles, Steel Blades, Berlin, 50@50&5%
Heinisch's Snips.....40%
Jennings & Griffin Mfg. Co.'s, 6½ to 10 in.....50%
Niagara Snips.....40%
P., S. & W. Forged Handles.....20%

Pruning Shears—
Cronk's Hand Shears.....33⅓%
Cronk's Wood Handle Shears.....33⅓%
Disston's Combined Pruning Hook and Saw, ℔ doz. $18.00.....25%
Disston's Pruning Hook only, ℔ doz., $12.00 .....25%
John T. Henry Mfg. Co.:
Pruning Shears, all grades.....50%
P., S. & W. Co.....33⅓%
Wilkinson's Hedge, Wilcut Brand, 60&10%
Wilkinson's Lawn and Border, Wilcut Brand.....60&10%

Sheaves—Sliding Door—
Stowell's Anti-Friction.....50%
Reading 40%
R. & E. list.....33⅓%
Wrightsville Hatfield Pattern.....80%

Sliding Shutter—
Reading list.....40%
R. & E. list.....33⅓%

Shells—Shells, Empty—
Brass Shells, Empty:
Climax, Club, Rival, 10 and 12 gauge .....65&5%
Paper Shells, Empty:
Acme, Ideal, Leader, New Rapid, Magic, 10, 12, 16 and 20 gauge..25&5%
Blue Rival, New Climax, Challenge, Monarch, Defiance, Repeater, Yellow Rival, 10, 12, 16 and 20 gauge 20%
Climax, Union, League, New Rival, 10 and 12 gauge.....25%
Climax, Union, League, New Rival, 14, 16 and 20 gauge.....20%
Expert, Metal Lined and Pigeon, 10, 12, 16 and 20 gauge.....33⅓&5%
Robin Hood, Low Brass.....20&5%
Robin Hood, High Brass.....30&5%

Shells, Loaded—
Loaded with Black Powder..40%
Loaded with Smokeless Powder, medium grade.....40&5%
Loaded with Smokeless Powder, high grade.....40&10&10%
Robin Hood Smokeless Powder:
Robin Hood, Low Brass.....50%
Comets, High Brass.....50&10&5%

Shoes, Horse, Mule, &c.—
F.o.b. Pittsburgh:
Iron .....per keg $4.00
Steel .....per keg $3.75
Burden's, all sizes.....℔ keg $3.90

Shot—
25-lb. bag.
Drop, up to B.....$1.90
Drop, B and larger.. ..... 2.15
Buck 2.15
Chilled 2.15
Dust 2.35

Shovels and Spades—
Association List, Nov. 15, 1902..40%

Snow Shovels—
Long Handle.....$2.75@3.00
Wood and Mall, D. Handle. $3.25@3.50

Sieves and Sifters—
Hunter's Imitation..... gro.$9.50@10.00
Hunter's Genuine..... per gro. $12.00@12.50
Buffalo Metallic Blued, R. M. Co., ℔ gr.

14&16	16&18	18&20
$13.20	$13.50	$14.40

Sieves, Seamless Metallic
—Per dozen.—

Mesh	*14*	*16*	*18*	*20*
Iron Wire	*$1.05*	*1.05*	*1.10*	*1.20*
Tinned Wire	*$1.15*	*1.15*	*1.20*	*1.30*

Sieves, Wooden Rim—
Nested, 10, 11 and 12 Inch.
Mesh 18, Nested....doz. $0.90@0.95
Mesh 20, Nested.....doz. $1.00@1.05
Mesh 24, Nested....doz. $1.30@1.40

Sinks, Cast Iron—
Painted, Standard list:
12 x 12 to 22 x 36 in....60&5%
20 x 40 to 24 x 50 in.....55%
24 x 60 to 24 x 120 in.....35%
Barnes' low list:
Up to and including 20 x 36 in....60%
20 x 40 to 24 x 50 in.....55%
NOTE.—There is not entire uniformity in lists used by jobbers.

Skeins, Wagon—
Cast Iron.....70@75&10%
Steel .....40@45%

Slates, School—
Factory Shipments.
"D" Slates.....50@50&10%
Eureka, Unexcelled Noiseless.. 60&5 ten»
Victor A, Noiseless .60&4 tens &5%

Slaw Cutters—See *Cutters.*

Snaps, Harness—
German .....40@40&10%
Covert Mfg. Co.:
Derby, 30&2%; Yankee, 30&2%; Yankee Roller, 30&2%
High Grade, 45%; Trojan.....45%
Jockey 35%
Oneida Community:
Harness Snaps, 1 inch.....60&5%
Swivel Snaps.....60%
Swivels 50%

Snaths—
Scythe 50%

Snips, Tinners—See *Shears.*

Spoons and Forks—
Silver Plated—
Good Quality.....50&10@60&5%
Cheap .....60@60&10%
International Silver Co.:
1847 Rogers Bros. and Rogers & Hamilton .....40&10%
Rogers & Bro., William Rogers' Eagle Brand.....50&10%
Anchor, Rogers Brand.....60%
Wm. Rogers & Son.....60&10%

Miscellaneous—
German Silver.....60@60&5%
Cattaraugus Cutlery Co.:
Seneca Silver.....50%

Tinned Iron—
Teas .....per gro. 45@50¢
Tables.....per gro. $0.50@$1.00

Springs—Door—
Chicago (Coil).....40&10%
Gem (Coil).....20
Pullman (Coil).....25%
Reliance (Coil).....40&10%
Star (Coil).....30
Torrey's Rod, 30 in.....℔ doz. $1.10

Carriage, Wagon, &c.—
1¼ in. and Wider:	*Per lb*
Black	*4@4¼¢*
Half Bright	*4@4¼¢*
Bright	*4½@4¾¢*

Painted Seat Springs:
1½ x 2 x 26.....per pr. 42¢
1½ x 3 x 28.....per pr. 70¢

Sprinklers, Lawn—
Enterprise .....25@30%
Philadelphia No. 1, ℔ doz. $12; No. 2, $15; No. 3, $24.....30%
Pleuger & Henger Mfg. Co.:
Cactus, 70%; Japanese, 75%; Nationals, 65%.

Squares—
Nickel plated.. } *List Jan. 5, 1900.*
Steel and Iron. } 75@80%
Rosewood Hdl. Try Square and T-Bevels .....60&10&10@70%
Iron Hdl. Try Squares and T-Bevels .....40&10@40&10&10%
Disston's Try Squares and Bevels, Rosewood Handle, 67½%; Iron Stock and Bevel.....20%
Winterbottom's Try and Miter, No. 1, 35%; No. 2.....45%

Squeezers, Lemon
Wood, Common, gro., No. 0, $5.25@$5.50; No. 1, $6.25@$6.50.
Wood, Porcelain Lined:
Cheap .....doz. $1.00
Good Grade.....doz. $1.25
Tinned Iron.....doz. $0.75@1.25
Iron, Porcelain Lined...doz. $1.75

Staples—
Barbed Blind.....lb. 6@6½¢
Electricians', Association list.. 80&10&10@10%
Fence Staples, Plain, $2.25; Galvanized $2.55
Poultry Netting Staples..... per lb. 3¼@3½¢
Grand Crossing Tack Co.'s list..80&10%

Steels, Butchers'—
Dick's 30%
Foster Bros.....30%
C. & A. Hoffmann's.....40%

Steelyards—....30@30&10%

Stocks and Dies—
Blacksmiths' .....50@50&10%
Curtis Rev'ble Ratchet Die Stock..25%
Derby Screw Plates.....25%
Green River.....25%
Lightning Screw Plate.....25%
Little Giant.....25%
Reece's New Screw Plates.....25%

Stoners, Cherry—
Enterprise .....25@30%

Stones—Oil, &c.
Chicago Wheel & Mfg. Co., 1904 list:
Gem Corundum Oil, Double Grit.60%
Gem Corundum Axe, Single or Double Grit.....60%
Gem Corundum Slips.....60%
Gem Corundum Razor Hones....50%
Pike Mfg. Co., 1904 list: ℔ lb.
Arkansas St. No. 1, 3 to 5½ in. 32.80
Arkansas St. No. 1, 5½ to 8 in. 33.50
Arkansas Slips No. 1.....$4.00
Lily White Washita, 4 to 8 in. 80¢
Rosy Red Washita, 4 to 8 in..80¢
Washita St., Extra, 4 to 8 in. 50¢
Washita St., No. 1, 4 to 8 in. 40¢
Washita St., No. 2, 4 to 8 in. 30¢
Lily White Slips.....90¢
Rosy Red Slips.....90¢
Washita Slips, Extra.....80¢
Washita Slips, No. 1.....70¢
Washita Slips, No. 2.....40¢
India Oil Stones (entire list)....33⅓%
Quickcut Emery and Corundum Oil Stone, Double Grit.....33⅓%
Quickcut Emery and Corundum Axe Stone, Double Grit.....33⅓%
Quickcut Emery Rubbing Bricks 33⅓%
Hindostan No. 1, R'g'lar. ℔ lb 8¢
Hindostan No. 1, Small..℔ lb 10¢
Axe Stones (all kinds).....
Turkey Oil Stones, Extra, 5 to 8 in.....℔ lb 80¢
Queer Creek Stones, 4 to 8 in. 20¢
Queer Creek Slips.....40¢
Sand Stone.....8¢

Scythe Stones—

Chicago Wheel & Mfg. Co.:
Gem Corundum, 10 in., $8.00 ₱ gro., 12 in., $10.80.
Norton Emery Scythe Stones:
Less than gross lots.....₱ gro. $9.00
One gross or more.....₱ gro. $7.20
Lots of 10 gross or more..₱ gro. $6.00
Pike Mfg. Co., 1901 list:
Black Diamond S. S..₱ gro. $12.00
Lamoille S. S.....₱ gro. $11.00
White Mountain S. S. ₱ gro. $9.00
Green Mountain S. S..₱ gro. $6.00
Extra Indian Pond S.S.₱ gro. $7.50
No. 1 Indian Pond S.S.₱ gro. $7.00
No. 2 Indian Pond S.S.₱ gro. $4.50
Leader Red End S. S.₱ gro. $4.50
Quick Cut Emery....₱ gro. $10.00
Pure Corundum,....₱ gro. $18.00
Crescent.....$7.00
Emery Scythe Rifles, 2 Coat. $8
Emery Scythe Rifles, 3 Coat. $10
Emery Scythe Rifles, 4 Coat, $12
Balance of 1904 list 33⅓%

Stoppers, Bottle—

Victor Bottle Stoppers.....₱ gro. $9.00

Stops— Bench—

Millers Falls.....15&10%
Morrill's, ₱ doz., No. 1, $10.00.....50%
Morrill's, No. 2, $12.50.....50%

Door—

Chapin-Stephens Co.....60@60&10%

Plane—

Chapin-Stephens Co.....20%

Straps— Box—

Cary's Universal, case lots.....25&20%

Stretchers, Carpet—

Cast Iron, Steel Points, dos. 60@60&10%
Sockct .....dos. $1.80
Bullard, ₱ doz.....$4.00
Excelsior Stretcher and Tack Hammer Combined, ₱ doz. $6.00.....30%

Strops, Razor—

Star Diagonal Strop.....25%

Stuffers, Sausage—

Enterprise Mfg. Co.....25@25&7½%
National Specialty Co., list Jan. 1, 1902.....30&5%

Sweepers, Carpet—

National Sweeper Co.: ₱ doz.
Louis XV, Roller Bearing, Gold Plated.....$120.00
Hepplewhite, Roller Bearing, Silver Plated.....$72.00
Sheraton, Roller Bearing, N'kel.$60.00
Ye Mission, Roller Bearing, Oxidized Coppered.....$36.00
Transparent, Roller Bearing, Plate Glass top, Nickeled.....$36.00
National Queen, Roller Bearing, Fancy Veneers.....$27.00
Loyal, Roller Bearing, Veneers, Nickeled.....$25.00
Triple Medal, Roller Bearing, Nickeled.....$24.00
Marion, Roller Bearing, N'kel.$24.00
Marion Queen, Roller Bearing, Nickeled.....$24.00
Monarch, Roller Bearing, N'kel.$22.00
Monarch, Roller Bearing, Jap..$20.00
Perpetual, Regular B'r'gs, N'kel.$20.00
Perpetual, Regular B'r'gs, Jap..$18.00
Monarch Extra (17 in, case), Roller Bearing, Nickeled.....$36.00
Monarch Extra (17 in, case), Roller Bearing, Japanned.....$33.00
Auditorium (26 in, case), Roller Bearing, Nickeled.....$54.00
Mammoth (30 in, case), Roller Bearing, Nickeled.....$60.00

NOTE.—Rebates: 50c per dozen on three-dozen lots; $1 per dozen on five-dozen lots; $2 per dozen on ten-dozen lots; $2.50 per dozen on twenty-five-dozen lots.

Streator Metal Stamping Co.:
Eureka Japanned.....₱ doz. $15.00
Model E, Sanitaire.....₱ doz $25.00
Model A, Sterling.....₱ doz. $25.00
Model B, Sterling, Nickeled.....₱ doz. $23.00
Model B, Sterling, Japanned.....₱ doz. $21.00
Model C, Sterling.....₱ doz. $21.50
Model D, Sterling.....₱ doz. $19.50

Tacks, Finishing Nails, &c.

New List, May 1, 1905.
American Carpet Tacks.... 90&10@—%
*American Cut Tacks.*90&10@—%
*Swedes Cut Tacks....*90&10@—%
*Swedes Upholsterers'.*90&50@—%
*Gimp Tacks.....*90&50@—%
*Lace Tacks.....*90&10@—%
*Trimmers' Tacks.....*90&10@—%
Looking Glass Tacks....65@—%
Bill Posters' and Railroad Tacks, 90&50@—%
Hungarian Nails.....85@—%
*Finishing Nails.....*70&10@—%
Trunk and Clout Nails..80@—%

NOTE.—The above prices are for Standard Weights. An extra 5% is given on Medium Weights, and an extra 10&5% is given on light weights.

Miscellaneous—

Double Pointed Tacks..... 90&5 *or 6 tens*
See also Nails, Wire.

Tanks, Oil— Each.

Emerald, R. M. Co.....30-gal. $3.40
Emerald, R. M. Co.....60-gal. $4.25
Queen City, R. M. Co.....30-gal. $3.65
Queen City, R. M. Co.....60-gal. $4.50

Tapes, Measuring—

American Asses' Skin ..50@—%
Patent Leather.....25@30&5%
Steel .....$3 1-3&5%
Chesterman's .....25@25&5%
Keuffel & Esser Co.:
Favorite, Ass Skin.....40&10@50%
Favorite, Duck and Leather..... 25&5@25&10%
Metallic and Steel, lower list, 35@35&5%; Pocket, 35@35&5%.

Lufkin's:
Asses' Skin.....40&10@50%
Metallic.....30@30&5%
Patent Bend, Leather....25&5@25&10%
Pocket.....40@40&5%
Steel.....33⅓@35%
Wiebusch & Hilger:
Chesterman's Metallic, No. 34L, etc.....25%
Chesterman's Steel, No. 1038L, etc.....35%

Teeth, Harrow—

Steel Harrow Teeth, plain or headed, ⅝-inch and larger... per 100 lbs. $2.75@$3.00

Thermometers—

Tin Case.....80&10@80&10&5%

Ties, Bale—Steel Wire—

Single Loop.....80&2½%
Monitor, Cross Head, &c....70%

Brick Ties—

Niagara Brick Ties.....25&10%

Tinners' Shears, &c.—

See *Shears, Tinners', &c.*

Tinware—

Stamped, Japanned and Pieced, sold very generally at net prices.

Tire Benders, Upsetters, &c.

See *Benders and Upsetters, Tire.*

Tools—Coopers'—

L. & I. J. White.....20@20&5%

Hay—

Myers' Hay Tools.....50%
Stowell's Hay Carriers, 50%; Hay Forks, 50%; Fork Pulleys, 50%.

Miniature—

Smith & Hemenway Co.'s, Davidson.....25%

Saw—

Atkins' Cross Cut Saw Tools.....40%
Simonds' Improved.....33⅓%
Simonds' Crescent.....25%

Ship—

L. & I. J. White.....25%

Transom Lifters—

See *Lifters, Transom.*

Traps—Fly—

Balloon, Globe or Acme, doz. $1.15@$1.25; gro.....$11.50@12.00
Harper, Champion or Paragon, doz. $1.25@1.40; gro. $13.00@13.50

Game—

Imitation Oneida.....75@75&5%
Newhouse.....45@45&5%
Hawley & Norton.....65%
Victor.....70&10%
Oneida Community Jump.....50%

Mouse and Rat—

Mouse, Wood, Choker, doz. holes 8½@9¢
Mouse, Round or Square Wire, doz. 85@80¢
Marty French Rat and Mouse Traps (Genuine):
No. 1, Rat, each $1.21; ₱ doz. $13.75
No. 3, Rat, ₱ doz. $4.50; case of 96 $5.75 doz.
No. 3½, Rat, ₱ doz. $5.25; case of 72 ₱ gro. $4.70 doz.
No. 4, Mouse, ₱ doz. $3.05; case of 150 $3.00 doz.
No. 5, Mouse, ₱ doz. $3.00; case of 150 $2.25 doz.

Trimmers, Spoke—

Wood's E 1.....50%

Trowels—

Disston Brick and Pointing.....25%
Disston Plastering.....20%
Disston "Standard Brand" and Garden Trowels.....30%
Kohler's Steel Garden Trowels, ₱ gro., 5 in., $4.80; 6 in., $6.00.
Never-Break Steel Garden Trowels.. ₱ gro. $6.00
Rose Brick and Plastering.....25&5%
Woodrough & McParlin, Plastering.25%

Trucks, Warehouse, &c.—

B. & L. Block Co.:
New York Pattern.....50&10%
Western Pattern.....60&10%
Handy Trucks.....₱ doz. $16.00
Grocery.....₱ doz. $15.00
Daisy Store Trucks, Improved Pattern.....₱ doz. $18.50
McKinney Truck.....each $10.00
Model Stove Trucks.....₱ doz. $18.50

Tubs, Wash— *No. 1 2 3*

Galvanized, per doz. $4.25 4.75 5.25
Galvanized Wash Tubs (R. M. Co.):
No. 1 2 3 10 20 30
Per doz., net.$5.70 6.30 7.20 6.60 7.20 8.10

Twine, Miscellaneous—

Flax Twine:
No. 9, ¼ and ½-lb. Balls .22@24¢
No. 12, ¼ and ½-lb. Balls.19@21¢
No. 18, ¼ and ½-lb. Balls. 16@18¢
No. 24, ¼ and ½-lb. Balls. 16@18¢
No. 36, ¼ and ½-lb. Balls. 15@17¢
Chalk Line, Cotton ½-lb. Balls .....25@30¢
Cotton Mops, 6, 9, 12 and 15 lb. to doz.....10@18¢
Cotton Wrapping, 5 Balls to lb., acording to quality...14½@20¢
American 2-Ply Hemp, ¼ and ½-lb. Balls.....13@14¢
American 3-Ply Hemp, 1-lb. Balls .....13@14¢
India 2-Ply Hemp, ¼ and ½-lb. Balls (Spring Twine)....9@10¢
India 3-Ply Hemp, 1-lb. Balls 9@10¢
India 3-Ply Hemp, 1½-lb. Balls. 8½@9½¢
2, 3, 4 and 5-Ply Jute, ¼-lb. Balls .....10½@12¢
Mason Line, Linen, ½-lb. Bls. 46¢
No. 264 Mattress, ¼ and ½-lb. Balls .....37¢
Wool, 3 to 6 ply...B 7½¢; A 8½¢

Vises—

Solid Box.....60%

Parallel—

Athol Machine Co.:
Simpson's Adjustable.....40%
Standard.....40%
Amateur.....25%
Columbian Hdw. Co.....40%
Emmert Universal:
Pattern Makers' No. 1, $15.00; No. 2, $12.50.
Machinist and Tool Makers' No. 4A, $12.50; No. 5A, $7.00; No. 6A, $10.00; No. 10A, $22.50.
Presto Quick Acting.....25@25&5%
Tiger Machinists'.....40%
Fisher & Norris Double Screw..15&10%
Hollands':
Machinists'.....40@40&5%
Keystone.....65@65&10%
Lewis Tool Co.:
Adjustable Jaw.....30%
Monarch, 50%; Solid Jaw.....50%
Massey Vise Co.:
Clincher.....40%
Perfect, 20%; Lightning Grip.....20%
Merrill's.....20%
Millers Falls.....60&10%
Parker's:
Victor, 20@25%; Regulars.....20@25%
Vulcau's.....40@45%
Combination Pipe.....55@60%
Prentiss.....20@25%
Snediker's X. L.....33⅓%
Stephens'.....33⅓%

Saw Filers—

Disston's D 3 Clamp and Guide, ₱ doz., $24.00, 30%; Clamps.....30%
Perfection Saw Clamps, ₱ doz....$4.50
Reading.....60%
Wentworth's Rubber Jaw, Nos. 1, 2 and 3.....50%

Wood Workers—

Massey Vise Co.:
Lightning Grip, 15%; Perfect.....15%
Wyman & Gordon's Quick Action, 6 in., $6.00; 9 in., $7.00; 14 in., $8.00.

Miscellaneous—

Bignall & Keeler Combination Pipe Vise.....60&10%
Holland's Combination Pipe..60@60&5%
Massey's Quick Action Pipe.....40%
Parker's Combination Pipe: 87 Series, 60%; 187 Series, 60&5%; No. 870, 40%.

Wads—*Price per M.*

B. E., 11 up.....60¢
B. E., 9 and 10.....70¢
B. E., 8.....80¢
B. E., 7.....80¢
P. E., 11 up.....$1.00
P. E., 9 and 10..... 1.25
P. E., 8..... 1.50
P. E., 7..... 1.50
Ely's B. E., 11 and larger.$1.70@1.75
Ely's P. E., 12 to 20....$3.00@3.25

Dis. 15%

Ware, Hollow—

Cast Iron, Hollow—

Stove Hollow Ware:
Enameled.....55%
Ground.....60%
Plain or Unground.....65%
Country Hollow Ware, per 100 lbs. $2.75
White Enameled Ware:
Maslin Kettles.....70%
Covered Ware
Tinned and Turned.....40%
Enameled.....50%
See also *Pots, Gluc.*

Enameled—

Agate Nickel Steel Ware.....60%
Iron Clad Ware.....70&10%
Lava, Enameled.....40&10%
Never Break Enameled.....50%

Tea Kettles—

Galvanized Tea Kettles:
Inch..... 6 7 8 9
Each .....45¢ 50¢ 55¢ 65¢

Steel Hollow Ware—

Avery Spiders and Griddles..65@65&5%
Avery Kettles.....60%
Porcelained.....50&5@50&10%
Never Break Spiders and Griddles.. 65&5%
Never Break Kettles.....60%
Solid Steel Spiders and Griddles.65&5%
Solid Steel Kettles.....60%

Warmers, Foot—

Pike Mfg. Co., Soapstone....40@40&10%

Washboards—

Solid Zinc: ₱ doz.
Crescent, family size, bent frame.$3.25
Red Star, family size, stationary protector.....$3.25
Double Zinc Surface:
Saginaw Globe, family size, stationary protector.....$2.90
Cable Cross, family size, stationary protector.....$3.15
Single Zinc Surface:
Naiad, family size, open back, perforated.....$2.65
Saginaw Globe, protector, family size, ventilated back.....$2.50
Brass Surface:
Brass King, Single Surface, open back.....$3.25
Nickel Plate Surface:
No. 1001 Nickel Plate, Single Surface.....$3.25
Glass Surface:
Glass King, Single Surface, open back.....$3.25
Enamel Surface:
Enamel King, Single Surface, ventilated back.....$3.25

Washers—Leather, Axle—

Solid .....50&10@80&10&10%
Patent .....90@90&5%
Coil: ⅛ 1 1¼ 1¼ Inch.
10¢ 11¢ 12¢ 13¢ per box

Iron or Steel—

Size bolt.... 5-16 ⅜ ½ ⅝ ¾
Washers ..$5.40 4.50 3.20 3.00 2.80
The above prices are based on $6.00 off list.

In lots less than one keg add ½¢ per lb.; 5-lb. boxes add ½¢ to list.

Cast Washers—

Over ½ inch, barrel lots..... per lb. 1¼@1½¢

Weather Strip—

Flexible Felt—

Lined, per 100 ft., $2; $3; $4.....40&10%
Moore's Unlined, per 100 ft., $2; $3; $4.....50&10%

Wedges—

Oil Finish.....lb. 2.70@2.80¢

Weights—Hitching—

Covert Mfg. Co.....40%

Sash—

Per ton, f.o.b. factory:
Eastern District...$27.50@$28.00
Southern Territory.$20.00@$23.00
Western and Central Districts .....$23.00@$25.00

Wheels, Well—

8-in., $1.55; 10-in., $2.00; 12-in., $2.50; 14-in., $4.00.

Wire and Wire Goods—

Bright and Annealed:
6 to 9.....80%
10 to 18.....80&2½%
19 to 26.....80&7½%
27 to 36.....80&2½%
Galvanized:
6 to 9.....75&5%
10 to 14.....75&7½%
15 to 16.....72½&10&2½%
19 to 26.....75%
27 to 36.....72½%
Coppered:
6 to 9.....75&5%
10 to 14.....75&7½%
15 to 18.....72½&10&2½%
19 to 26.....75&10&5%
27 to 36.....75%
Tinned:
6 to 14.....75&10&2½%
15 to 18.....75&7½%
Annealed, Steel and Tinned, on Spools ..70&10&10@70&10&10&10%
Brass and Copper on Spools... 60&5@60&10&5%
Brass 7½%
Cooper 10%
Cast Steel Wire.....50%
Wire Clothes Line, see Lines.
Wire Picture Cord, see Cord.

Bright Wire Goods—

List June 24 '03....90&20@90&25%
Brass Cup Hooks and Brass Screw Hooks.....85@—%

Wire Cloth and Netting—

Galvanized Wire Netting..... 80&5@80&10%
Painted Screen Cloth, 100 ft., $1.00@1.10
Standard Galv. Hardware Grade:
Nos. 2, 2½ & 3 Mesh, sq. ft..3 ¢
Nos. 4 and 5 Mesh, sq. ft..3½ ¢
No. 6 Mesh, sq. ft.....3½ ¢
No. 8 Mesh, sq. ft.....4 ¢

Wire, Barb—See *Trade Report*

Wrenches—

Agricultural .....80@80&5%
Alligator or Crocodile..70&10@75%
Baxter Pattern S Wrenches... 70&5@70&10%
Drop Forged S.....45@45&5%
Acme.....60&10%
Alligator Pattern, 70%; Bull Dog..70%
Bemis & Call's:
Adjustable S, 40%; Adjustable S Pipe, 40%; Briggs Pattern, 40%; Combination Bright, 40%.
Bemis Pipe.....60%
Combination Black.....40&5%
Merrick Pattern.....50%
Boardman's 40%
Coes' Genuine Knife Hdl..40&10&5&5%
Coes' Genuine Steel Hdl..40&10&5&5%
Coes' Genuine Key Model..40&10&5&5%
Coes', Genuine Hammer Handle..... 40&10&5&5%
Coes' "Mechanics'"...40&10&10&5&5%
Donohue's Engineer.....40&10%
Eagle.....50&10%
Elgin Wrenches, ₱ doz.....$6.25
Elgin Rethreading Attachment, only with one die, ₱ doz.....$6.25
Elgin Extra Dies, ₱ doz.....$3.00
Elgin Extra Jaws, ₱ doz.....$1.75
Elgin Monkey Wrench Pipe Jaws, ₱ doz.....$2.10
Gem Pocket.....30%
Hercules.....70%
W. & B. Machinist:
Case lots.....50&5%
Less than case lots.....50%
W. & B. Railroad Special:
Case lots.....50%
Less than case lots.....40&10&5%
Solid Handles, P., S. & W.....50&5%
Stillson.....65%
Vulcan Chain.....50%

Fruit Jar—

Triumph Fruit Jar Wrench, 5 gross lots, ₱ gross, $7.50; ₱ doz.....$0.80

Wringers—

Tuttle Roller Press Mop Pail Wringer, each, $8.00; ₱ doz.....$18.00

Wrought Goods—

Staples, Hooks, &c., list March 17, '02.....50@90&10%

Yokes, Ox, and Ox Bows—

Fort Madison's Farmers' & Freighters'.....list net

Zinc—

Sheet.....per 100 lbs., $8.15@8.40